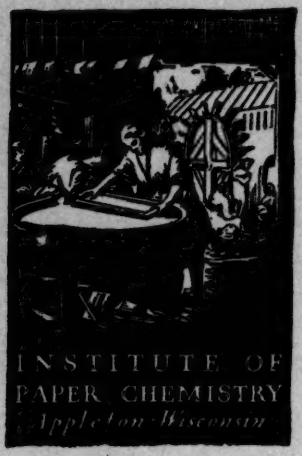
PAGES 771-842

BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

LIBRARY NOTES

JULY • 1950

Volume 20 Number 11

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Books and Pamphlets Added to the Library During June

ALLOYS

FRANKS, RUSSELL, JUPPENLATZ, J. W., KRIVOBOK, V. N., LAQUE, F. L., PETERS, F. P., and SCHOEFER, E. A. Data on corrosion- and heat-resistant steels and alloys—wrought and cast; prepared for A.S.T.M. Committee A-10 on Iron-Chromium, Iron-Chromium-Nickel, and Related Alloys, with the cooperation of American Iron and Steel Institute and Alloy Casting Institute. Special technical publication no. 52-A. Philadelphia, American Society for Testing Materials, 1950. 79 p.

BOTANY

GRAY, ASA. Gray's manual of botany; a handbook of the flowering plants and ferns of the central and northeastern United States and adjacent Canada. 8th (centennial) ed.—ill. Largely rewritten and expanded by Merritt Lyndon Fernald, with the assistance of specialists in some groups. New York, American Book Company [c1950] 1632 p.

CHEMISTRY, ORGANIC

ALEXANDER, ELLIOT R. Principles of ionic organic reactions. New York, Wiley [c1950] 318 p.

BEILSTEIN, FRIEDRICH KONRAD. Beilstein's Handbuch der organischen Chemie. 4. Auflage. Zweites Ergänzungswerk, die Literatur von 1920-1929 umfassend, herausgegeben und bearbeitet von Friedrich Richter. Berlin, etc., Springer-Verlag, 1950. 11. Band. 286 p.

WHELAND, G. W. Advanced organic chemistry. 2d ed. New York, Wiley [c1949] 799 p.

COLLOIDS

ADVANCES in colloid science. Vol. III. ed. by H. Mark and E. J. W. Verwey. New York, Interscience Publishers, 1950. 384 p.

ENGINEERING—BIBLIOGRAPHY

The ENGINEERING INDEX, 1949. New York, Engineering Index, Inc. [c1950] 1370 p.

GRAPHIC METHODS

ADAMS, DOUGLAS P., comp. and ed. An index of nomograms. New York, published jointly by The Technology Press of Massachusetts Institute of Technology and Wiley [c1950] 174 p.

PAPER—SAMPLE BOOKS

TAYLOR, JACK W. The characteristics and functions of printing papers. [Tulsa, Okla., The Author, c1950] no paging.

PLASTIC MATERIALS

MODERN PLASTICS encyclopedia and engineer's handbook, 1950. New York, Plastics Catalogue Corp., c1950. 1212 p.

POLYMERS AND POLYMERIZATION

MARK, H., and TOBOLSKY, A. V. Physical chemistry of high polymeric systems. 2d compl. rev. and aug. ed. New York, Interscience Publishers, 1950. 506 p.

RESEARCH

MEES, C. E. KENNETH, and LEERMAKERS, JOHN A. The organization of industrial scientific research. 2d ed. New York, McGraw-Hill Book Co., 1950. 383 p.

TESTING

AMERICAN SOCIETY FOR TESTING MATERIALS. 1949 Book of A.S.T.M. standards including tentatives (a triennial publication). Philadelphia, The Society [c1949-50] 6 v. Part 1, Ferrous metals. 1372 p.; Part 2, Non-ferrous metals. 1140 p.; Part 3, Cement, concrete, ceramics, thermal insulation, road materials, waterproofing, soils. 1344 p.; Part 4, Paint, naval stores, wood, adhesives, paper, shipping containers. 1289 p.; Part 5, Textiles, soaps, fuels, petroleum, aromatic hydrocarbons, water. 1697 p.; Part 6, Electrical insulation, plastics, rubber. 1374 p.

UNIVERSITIES AND COLLEGES

VERBAND DEUTSCHER STUDENTENSCHAFTEN. Deutscher Hochschulführer, 1950. Herausgegeben auf Grund amtlicher Unterlagen. Bonn, Wilhelm Stollfuss Verlag, 1950. 175 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ACID RESISTANT MATERIAL

AMERICAN IRON AND STEEL INSTITUTE. Stainless steel . . . what makes it so? Paper Ind. 32, no. 3: 288 (June, 1950).

Stainless steels owe their remarkably great corrosion resistance to their chromium content, usually ranging from 12-27%, depending upon the type of steel and the service for which it is intended. In the presence of oxygen, a thin, hard, continuous, self-healing, invisible oxide film is formed on the clean surface of iron-chromium alloys, which acts as an effective barrier against progressive attack by corrosive agents. E.S.

ADHESIVES

COLLINSON, H. A. Adhesives. Plastics Inst. (London), Trans. 17, no. 27: 68-82 (1949); J. Soc. Dyers Colourists 65, no. 11: 579-80 (November, 1949); Tech. Bull. Brit. Paper and Board Makers' Assoc. 26, no. 7-9: 51-2 (July-September, 1949). [Abstracts only available]

A survey of the salient properties of each common type of adhesive and of some recent applications is followed by a tabular classification of adhesives, giving type, constituents and manufacture, general characteristics, and uses. E.S.

LA BRIE, LAURENT J. Trends in folding carton adhesives. Shears 68, no. 690: 27-8, 65 (June, 1950).

Following a brief history of the adhesive industry, the author examines the relative merits of dextrin, animal, and resin glues. Resin glues are the highest priced, but they are the fastest setting and are the only adhesives that will handle transparent and foil-lined board, produce moistureproof seams, and permit very high production rates. Suggestions are offered for selecting the proper adhesive for particular jobs, and a warning is given against haphazard dilutions. 1 illustration. J.A.B.

SHOALS, ROGER. Dextrines and adhesives for high-speed machines. Am. Paper Converter 24, no. 6: 12, 24 (June, 1950); Tappi 33, no. 7: 64-6A (July, 1950); Fibre Containers 35, no. 7: 60-1 (July, 1950).

A brief review is given of the history and development of dextrin adhesives, and it is pointed out that although the technique of converting dextrin has been vastly improved, the end product presents as many performance problems as it did 35 years ago. The industry's current problem is the development of economical adhesives capable of performing at the high speeds of new, faster packaging machinery. J.A.B.

ALGINIC ACID

TALLIS, ERNEST E. The structure of textile fibres. XII. Alginate fibres. J. Textile Inst. 41, no. 2: P52-5 (February, 1950).

The molecular and fine structure of calcium alginate fibers is discussed; reference is made to the existence of two other alginate fibers of interest, beryllium and chromium alginates. 8 figures. E.S.

ALKALINE PROCESSES

ANON. "Gruco" method of pulp production. Indian Pulp and Paper 4, no. 9: 358-62; no. 10: 398-9 (March, April, 1950).

The details of a modified sulfate process, a Swedish development, suitable for the digestion of nonlignified plants (straw, cornstalks, grass, bagasse, bamboo, etc.) are given. Lower quantities of caustic and sodium sulfide, lower temperatures, and a shorter cooking cycle (not exceeding four hours) than in the standard process are employed. In the case of straw, the digester is preferably charged with the entire pressed bales, with wires removed and without chopping. Bagasse may be charged in a moist condition, provided allowance is made in the composition of the cooking liquor for the higher moisture content of the material. The cooking liquor may consist of a mixture of white and black liquor, although the use of white liquor alone is preferable for straw, grasses, and bagasse to avoid discoloration of the cooked pulp. The chemicals in the black liquor may be reclaimed in a manner similar to the standard sulfate process; however, special equipment is required for precipitating and separating the siliceous impurities with burnt or slaked lime to prevent scale formation on the evaporator walls. Results obtained by this method are given with regard to pulp qualities and yields in the digestion of wheat straw, bamboo, sabai grass, and bagasse (*cf.* also note in World's Paper Trade Rev. 133, no. 8: 510 [Feb. 23, 1950]). E.S.

ALKALINE PROCESSES—FURNACES

WYKMAN, TORSTEN. A new recovery unit for the sulfate industry—Combustion Engineering-AB Svenska Maskinverken. Svensk Papperstidn. 53, no. 8: 205-9 (April 30, 1950). [In Swedish; English summary]

A new type of recovery unit is described, which presents a combination of the well-known Combustion Engineering furnace for the burning of black liquor and recovery of chemicals and a boiler operating with forced circulation for heat recovery. The advantages of the forced-circulation system can thus be utilized for the easier cleaning of the heating surfaces. The operating experience of the first installation in the Norwegian sulfate mill at Moss is discussed, and preliminary data from the official acceptance test are given. 1 table and 4 figures. E.S.

BAGASSE

ANON. Sugar cane bagasse good for paper and board manufacture. Southern Pulp Paper Manuf. 13, no. 6: 40, 42 (June, 1950).

Brief reference is made to the suitability of bagasse as pulp- and papermaking raw material, particularly in connection with alcohol plants. A contract for a new bagasse pulp mill near a large sugar factory in São Paolo, Brazil has just been signed with Celdecor Africa (Pty.) Ltd., Benoni, South Africa. The plant will follow the usual lines of the Celdecor-Pomilio process for fine paper pulp; the pulp will be bleached in a continuous Celdecor-Kamyr plant. 4 illustrations. E.S.

BAMBOO

TROST, E. Mechanical handling of bamboo from river to digester. Indian Pulp and Paper 4, no. 9: 355-7 (March, 1950).

A discussion of the handling of bamboo is divided into the following stages: river haul-up, bamboo storage, chipping, chip storage, and digester charging. A successful chipper for bamboo has recently been developed, which is set up at an incline from the vertical, so the bamboo lies in the bottom of the spout; the spout is divided into three compartments. A new type of ground-level chip-storage bin with automatic reclaiming devices has also been introduced; it permits unrestricted capacities, eliminates arching and dead chip pockets, provides complete turnover in a relatively short period, and regulates an even flow of chips to the digesters. J.A.B.

BARK

GROSJEAN, J. Substances with fungicidal activity in the bark of deciduous trees. Nature 165, no. 4204: 853-4 (May 27, 1950).

The hot water extracts of barks from various *Populus* species (*P. candicans, P. trichocarpa, P. regenerata, P. serotina erecta,* and *P. marilandica*) all showed marked fungicidal activity. Extracts from several other poplar barks showed very weak activity, and the bark from *Alnus glutinosa, Fagus sylvatica,* and *Quercus pedunculata* showed almost no activity. 2 references. L.E.W.

ÖGLAND, N. J. Bark, raw material or waste product? Svensk Papperstidn. 53, no. 6: 164-6 (March 31, 1950). [In Swedish; English and German summaries]

The author reviews the literature on the utilization of bark. 2 tables, 6 figures, and 21 references. E.S.

RINDSLAND, WM. C. Bark utilization at Mando. Paper Ind. 32, no. 3: 278-80 (June, 1950); *cf.* B.I.P.C. 20: 101.

An illustrated description of the new bark-disposal plant at the International Falls mill of the Minnesota and Ontario Paper Co. is given. For many years, the wood refuse had been discharged into the Rainy River, which method was replaced by burning in an old-time sawdust incinerator and this, in turn, was replaced by the new waste-disposal plant. The operations are centered in a fireproof building of steel and brick construction located between the grinder room and the pump house on the river. Refuse from barkers and slashers is sluiced to a settling chamber to permit rocks, tramp iron, etc., to settle before the effluent enters the rotary screen, from where it flows with a moisture content of 75% to two screw presses operating in tandem fashion. The refuse leaves the second press with a moisture content of about 50%, is conveyed to a chipper which breaks up lumps, and from there to either the boiler or to storage. The boiler is designed to burn wood waste in suspension and is equipped with three combination oil and wood burners, the oil being used for starting up. It produces 50,000 pounds of steam per hour at 450 p.s.i. working pressure and 150 degrees (Fahrenheit) of superheat. Wood waste from spruce, balsam, poplar, tamarack, and jack pine in varying quantities is burned in the system. Each has its own characteristics which vary with the season and affect the operation of the various pieces of equipment. 1 flow-sheet and 4 illustrations. E.S.

BARKERS AND BARKING

LEAF, C. S. New Streambarker for pulpwood. Southern Pulp Paper Manuf. 13, no. 6: 52-5 (June, 1950).

An improved model of the Streambarker, designated as Model D, is described; it is lower in appearance, heavier in construction, and more readily accessible than its predecessors. The maximum log size which can be handled has been increased from 18 to 24 inches. Details of the new construction are given, as well as data on power and maintenance costs. 1 illustration. E.S.

BIBLIOGRAPHY

WEST, CLARENCE J. Bibliography Committee. Tappi 33, no. 6: 52A, 54A (June, 1950).

The history of the TAPPI Committee on Bibliography since its inception and its activities to date are outlined. E.S.

BLEACHING

SAMUELSON, OLOF, and RAMSEL, CURT. Effect of chlorine and chlorine dioxide bleaching on copper number, hot alkali solubility and carboxyl content of sulphite cellulose. Svensk Papperstidn. 53, no. 6: 155-63 (March 31, 1950). [In English; German and Swedish summaries] *cf.* B.I.P.C. 20: 431.

The present work is a study of the changes in copper number (I) and hot-alkali solubility (II) in sulfite pulp during different bleaching procedures. Bleaching experiments with chlorine at different pH values showed that (I) and (II) increase considerably in acid and neutral media; on prolonged degradation of the pulp, the carboxyl content (III) also increases markedly. When bleaching in a strongly alkaline medium, (I) and (II) decrease distinctly, with a simultaneous considerable increase in (III). When pulps bleached to constant viscosities are compared, it is found that (I), (II), and (III) depend not only upon the pH of the bleaching medium, but also upon the quantity of chlorine which has been added. Bleaching experiments with chlorine dioxide in an acid medium, on the other hand, confirmed earlier observations that chlorine dioxide bleaching does not cause any decrease in the viscosity of the pulp; (I), (II), and (III) are not affected. The same applies to a pulp previously subjected to a hypochlorite bleach or to a pulp overbleached in an alkaline medium. Oxycellulose obtained by degradation with chlorine in acid medium shows a distinct increase in (III) during chlorine dioxide treatment and a corresponding decrease in (I) and (II). These experiments show that no oxidation of carbonyl groups to (III) can be observed when bleaching with chlorine dioxide in an acid medium, if the sulfite pulps have been subjected to normal chlorination or hypochlorite bleaching in an alkaline medium. However, a distinct decrease in the carbonyl content can be noted when strongly overbleached pulps obtained by degradation of the cellulose with chlorine in an acid medium are subjected to the chlorine dioxide treatment. The advantages of a combined hypochlorite-in-alkaline-medium and chlorine dioxide bleaching procedure are discussed. This combination makes possible the attainment of pulp qualities which cannot be obtained from the use of either bleaching agent alone or from a combination of chlorination with either agent. 4 tables, 7 diagrams, and 24 references. E.S.

BOARD

ELMENDORF, ARMIN. Research develops four new products. Wood 5, no. 5: 17-18, 43-4 (May, 1950).

The author describes four new wood products developed by Elmendorf Research: fire-resistant wallboard made from strandlike fibers resembling excelsior and various binders, preferably gypsum (*cf.* B.I.P.C. 19: 756-7); compressible sheathing for wall and roof use, made from kiln-dried lumber and faced with kraft liner bonded to each side; fire-retardant sheathing for subflooring made from green lumber faced with kraft bonded to the rough wood with an inorganic binder; and flexible wood flooring made from sawmill trim and short-length lumber previously used for fuel. 2 illustrations. E.S.

JOHNSON, L. S. Cylinder board for folding cartons. Fibre Containers 35, no. 6: 102, 104, 106 (June, 1950).

A cylinder-machine made board has a definite grain, with the resistance to tear across the machine direction considerably greater than with the machine direction; tensile strength and stiffness as measured by bending tests also show this characteristic difference, which is lacking in Fourdrinier-made boards. Cylinder-machine boards can consist of as many different stocks as there are cylinders on the machine; however, a board generally consists of three stocks or less. The carton boards commonly used may be divided into 10 general groups, ranging from virgin all wood-pulp boards to those made entirely of the lower grades of waste paper (clay-coated, single-bleached lined manila, white-lined or colored patent-coated, bleached manila-lined, solid bleached sulfite or sulfate, kraft vat-lined or jute, solid unbleached kraft, solid manila, news, and chip boards); their properties are described briefly. All of these boards can be given a number of special treatments, such as silicate coating, waxing, or lining with greaseproof or decorative papers. The size and weight of the load to be borne by a carton will determine the weight, thickness, and strength of the paperboard to be used. In addition, printing, cutting, creasing, and gluing requirements must receive consideration. The author discusses the factors which exert an influence on these operations and stresses the importance of supplying the board manufacturer with all pertinent data. E.S.

NARAYANAMURTI, D., RANGANATHAN, V., and BIST, BHARAT SINGH. Studies on building boards. Part III. Boards from wood shavings and saw dust. Forest Research Inst., Dehra Dun, Indian Forest Leaflet No. 110: 7 p. (1948, publ. 1949); *cf.* B.I.P.C. 20: 700.

The following types of board were prepared: wood wool-cement and -protein boards; hardboards containing sawdust, coir, etc., using protein binders, and boards made from sawdust and various formaldehyde resins. These compare favorably with foreign boards. Tabulated data on the physical properties are given. The best results were obtained with peanut protein-formaldehyde and phenol-formaldehyde mixtures. 3 tables. L.E.W.

BOARD MILLS

ANON. Allis Chalmers supplies. Paper Mill News 73, no. 23: 16, 18 (June 10, 1950).

A list of Allis-Chalmers equipment is given which was supplied to the Antioch, Calif. mill of Fibreboard Products, with particular reference to the rotary kiln for reburning lime sludge. E.S.

ANON. Fibreboard's San Joaquin mill. Fibre Containers 35, no. 6: 68, 70 (June, 1950); Paper Trade J. 130, no. 22: 10-11 (June 1,

1950); Paper Mill News 73, no. 23: 14-16 (June 10, 1950); Shears 68, no. 690: 36 (June, 1950).

A brief illustrated description is given of the San Joaquin Division of Fibreboard Products, Inc., near Antioch, Calif., which will add 250 tons daily capacity to the company's present output of over 750 tons of paperboard for packaging purposes. The new mill is the first kraft mill (either semikraft or standard kraft) in California; it houses two paperboard machines, a Fourdrinier making 9-point corrugating material from previously burned wood waste, and a cylinder machine producing bleached kraft for different types of food cartons, chiefly from fir trees unsuitable for lumber. The pulping of the corrugating medium is accomplished by three Chemipulpers using a kraft cooking liquor; these operate continuously employing 15- to 18-minute cooking cycles; the pulp is refined in hot black liquor in Sutherland refiners and, after washing, is ready for delivery to the board machine. 7 illustrations. E.S.

ANON. Masonite's fibreboard mill starts producing in September. Paper Mill News 73, no. 25: 12-15 (June 24, 1950).

The new manufacturing plant of the Masonite Corp. at Ukiah, Calif., for making wood fiber hardboard will probably start in September. Reference is made to the construction of a logging road to the company's timber tract, personnel, and the development of different types of hardboard by Masonite since 1926. 7 illustrations. E.S.

PORTER, RICHARD W. Modernization at Maizewood's insulating-board mill. Paper Ind. 32, no. 3: 270-4 (June, 1950).

A brief illustrated description of the highlights of the modernization program at the insulating-board mill at Dubuque, Iowa, of the Maizewood Insulation Co. is given. The mill was built in 1929 to make insulating board from cornstalks; its processes have now been broadened to utilize practically any type of fibrous material, including straw, flax shives, hemp, wood, and waste paper. A semichemical pulping procedure is employed; the pulp is then successively refined in three Sprout-Waldron refiners, a Vortex beater, a Claflin refiner, and three Noble and Wood jordans, and pumped to the Shartle Fourdrinier board machine. Special reference is made to a new packaging machine which wraps bundles of six to eight sheets of insulating wallboard in kraft paper and seals them with reinforcing strips. 1 flowsheet and 18 illustrations. E.S.

PULP & PAPER. New wood industry; complete story of Fibreboard mills. Pulp & Paper 24, no. 7: 40-2, 44, 47-8, 50, 54, 58, 60, 62, 64 (June, 1950).

A detailed, illustrated description of the installations of the new kraft board mills of Fibreboard Products Inc. on Suisun Bay near Antioch, Calif., is given. The new mills are in two units. The Tuf-Fir mill, using a kraft semichemical process, makes 9-point corrugating board on a Pusey & Jones Fourdrinier machine; about 110 tons daily will be produced from wood waste. The standard bleached kraft pulp and board mill will produce about 150 tons per day, of which 125 tons will be bleached for conversion into board for food containers on a Black-Clawson cylinder machine; 25 tons of unbleached pulp will be shipped to other Fibreboard mills. The kraft mill uses cull logs from the company's lumber operations and purchases Douglas fir from the coastal region of California. Wood preparation, the operations of both pulp mills and the board mill, chemicals and water, the recovery unit, power plant,

finishing and storage, and key personnel are outlined. Numerous illustrations, including one flowsheet. E.S.

BOARD TESTING—PHYSICAL

MARENHOLTZ, P. E. Electronic water penetration tester. Tappi 33, no. 6: 289-91 (June, 1950).

The current practice of making water-penetration tests by means of the dry indicator method has been found to be unsatisfactory both from the standpoint of accuracy and convenience. More accurate test methods have been developed, but a simpler and faster method is needed. The electronic water-penetration tester was developed in an effort to answer these needs. It provides an automatic means of registering the time required for water to penetrate a specified depth into the board. The electrical conductivity of the penetrating water is utilized to close an electric circuit. A needle acting as an electrode is inserted into one face of the sample to such a depth that its point is a specified distance from the opposite face which is exposed to water. The instrument is provided with an elapsed-time meter which is started at the beginning of the test. At the instant the penetrating water reaches the needle point, the elapsed-time meter stops and a signal light in the instrument is turned on to indicate that the test is complete. This instrument and method offer the advantage of being entirely automatic after the test is started. The final meter reading may be taken at any time after the test is complete. 2 diagrams and 2 references. E.S.

MORY, HEINRICH. Contribution to the problem of handmade board production, especially high-quality boards. Das Papier 4, no. 9/10: 144-9 (May, 1950). [In German] *cf.* B.I.P.C. 20: 6.

The effects of operating speed on the dry weight of the sheet on the forming roll were studied. The more rapid was the operation, the greater was the water content (but the percentage change in basis weight of the finished board was only 3-4%; when the sized furnish contained 30% soda pulp and 70% waste paper, free from groundwood). With other furnishes (e.g., unbleached 100% soda pulp), however, no noticeable change in dry content with machine speed was noted. Speed of operation had relatively little effect on the tensile strength of the sheet unless the latter had been previously folded, once longitudinally, and once crosswise, in which case the strength dropped with the speed of operation. In the cross-machine direction, the percentage elongation decreased with speed, whereas folding endurance actually increased in the machine direction, but dropped slightly in the cross-machine direction of the sheet. For a constant machine speed, the effect of the number of laminations on the dry weight per layer was quite marked. Thus when 27 laminations were made, the weight in a single layer was 26.5 g./sq.m., whereas when the number of laminations dropped to 10, this figure rose to 72.5 g./sq.m. Studies were also made showing the influence of the number of laminations on various strength properties, the effects of pressure changes on the forming rolls on the dry weight of the board, and the effect of board thickness on its dry content at the forming roll. In the latter case no change in percentage moisture was noted up to 2 mm. thickness of the finished board. The author also showed that the percentage of dry weight dropped with an increase in degrees S.-R. 7 tables and 7 graphs. L.E.W.

BUYING

PERRY, HENRY J. Who buys? Paper Trade J. 130, no. 25: 19-20 (June 22, 1950).

The author discusses critically the purchasing functions of the pulp and paper industry and gives suggestions for improvement. E.S.

CAUSTIC SODA

CHEMICAL ENGINEERING. Chlorine and caustic made in Canada. Chem. Eng. 57, no. 6: 178-81 (June, 1950).

A pictured flowsheet is presented, which illustrates the operations involved in the new mercury-cell caustic and chlorine plant of the Aluminum Co. of Canada, Ltd., at Arvida, Que. The nominal capacity of the plant is 22,000 tons of caustic soda per year; this supplies part of the company's alkali requirements for refining bauxite. Some of the chlorine is used by the company; the rest is sold on the Canadian market. Salt arrives by ship during the summer and is stored at Port Alfred on the Saguenay River; from here it is shipped by rail, as required, the 20-mile distance to Arvida. The Mathieson mercury cells (*cf.* B.I.P.C. 18: 228) are rated at 15,000 amperes, but provision has been made for increasing this rating to 20,000 amperes. E.S.

CELLOPHANE

BAYUK CIGARS, INCORPORATED. Triple-sealed cigars. Modern Packaging 23, no. 10: 96-9 (June, 1950).

Breaking with tradition, the company has discarded the traditional wood-type box, and is packaging its Phillies cigars preconditioned to a precise 16% of moisture in three hermetically sealed cellophane wrappings: first, the individual cigar; second, a tear-tape wrap on the carton of five; and third, the overwrapping of five cartons in U-board. The different packaging steps are illustrated. The shelf life is estimated at about six months. 5 illustrations. E.S.

CELLULOSE

WARD, KYLE, JR. Crystallinity of cellulose and its significance for the fiber properties. Textile Research J. 20, no. 6: 363-72 (June, 1950).

The author treats this subject mainly from the standpoint of cotton cellulose. The concept of crystallinity is discussed not simply in the narrow sense of degree of crystallinity but in the broader sense, which involves the whole fine structure of cellulose. With respect to crystallinity in the latter sense, there are four main factors, each involving a mean value and a distribution of values, both mathematical and spatial. These parameters, independent within certain limits, are (1) the nature of the crystal lattice, (2) the percentage of crystalline material, (3) the size of the crystallites, and (4) the orientation of the crystallites. A well-planned analysis of covariance between these factors and the important physical properties of cotton would be desirable. This would be a task of considerable magnitude, even if other variables not directly related to crystallinity, such as molecular size and morphology, were not active. In the absence of such an analysis it is still possible to show the marked influence of some of these parameters on certain of the important physical properties of cotton. The relation of physical properties to the crystalline modification has been pointed out frequently by a comparison of the properties of the native fibers with those of regenerated fibers or with those of mercerized fibers. However, the changes in the percentage of crystalline material which usually occur in these transformations have not been evaluated exactly, and the conclusions drawn from previous studies should probably be checked. Decreased crystallinity and higher content of amorphous cellulose is symbatic with increased elongation, increased moisture regain,

and increased chemical reactivity. Of particular interest in the last category is the special case of hydrolysis, a reaction in which it is possible that crystallization may occur. Data on the third parameter, the size of the crystallite, are too scanty to permit any conclusions to be drawn. A study of this factor will have to wait for improved methods for measuring the size and size distribution of the crystalline areas. The increase of fiber strength and of refractive index with improved orientation has been well established. A decrease in elongation usually accompanies this. 5 tables, 7 figures, and 53 references. E.S.

CELLULOSE—DEGRADATION

SÖNNERSKOG, SVEN. The theory of ester resonance in cellulose compounds. Svensk Papperstidn. 53, no. 7: 185-7 (April 15, 1950). [In German; English and Swedish summaries]

The aging of alkali cellulose, the alkali solubility of oxycellulose, and the breakdown of nitrocellulose by the action of strong bases in general may be explained theoretically by the high degree of mobility of the hydrogen atom, linked to carbon-1 in the glucose units. The migration of this proton may cause an ester resonance, resulting in the hydrolysis of glucosidic linkages. This theory shows a great similarity with Heuser's explanation of the aging of alkali cellulose (*cf.* Heuser, The chemistry of cellulose. New York, Wiley, 1946, p. 477). Examples are given. 4 references. E.S.

CELLULOSE—REACTIVITY

ROSENTHAL, A., and BROWN, R. K. The reactivity of cellulose. I. Differences in nitrogen contents and viscosities of the nitrates of dewaxed cotton linters alternately wetted with water and dried directly. Pulp Paper Mag. Can. 51, no. 6: 99-105 (May, 1950).

When dewaxed cotton linters were alternately immersed in distilled water and dried directly, it was found that both the accessibility to thallous ethylate in ether and the degree of nitration with a standard nitric acid-sulfuric acid-water mixture increased with the number of times the cellulose was wetted and dried. The magnitude of the change in reactivity of the linters depended upon the sharpness of the drying and upon the number of wetting-drying cycles. Although there appeared to be a gradual but continued increase in accessibility, the degree of nitration apparently reached a maximum after seven cycles, the maximum being determined for the standard mixture employed by the intensity of the drying process. Wetting and mere air drying led to an increase of 0.17% nitrogen, whereas alternate wetting followed by drying with phosphoric anhydride or concentrated sulfuric acid brought about a change in degree of substitution of as much as 0.45% nitrogen. The *n*-butyl acetate solutions of the nitrated samples of any one series showed values for the viscosity which decreased with the number of wetting-drying cycles in spite of the greater substitution. When two linter samples, previously shown to differ markedly in reactivity because of unequal moisture history, were exposed for several months to the atmospheric conditions prevailing in either a heated basement room or an open, unheated shed during the winter months, or were merely stored for the same length of time in a desiccator containing no drying agent, their differences in reactivity were largely, if not completely, eliminated. The results support the belief that the variable moisture history of celluloses may be partly responsible for their occasionally unexpected deviations from the normal behavior to reagents. 4 tables, 2 figures, and 24 references. E.S.

CELLULOSE ESTERS

MALM, CARL J., TANGHE, LEO J., and LAIRD, BARBARA C. Primary hydroxyl groups in hydrolyzed cellulose acetate. J. Am. Chem. Soc. 72, no. 6: 2674-8 (June, 1950).

The primary hydroxyl contents of hydrolyzed cellulose acetates of different acetyl contents have been determined by reaction with trityl chloride. The percentage of primary hydroxyl is influenced by the amount of water in the hydrolysis bath. An increase in water concentration gives an increase in percentage of primary hydroxyl. The percentage of primary hydroxyl is not affected by the temperature, or by the amount and nature of the catalyst during the hydrolysis. The amount of sulfuric acid catalyst in the esterification influences the percentage of primary hydroxyl in the early part of the hydrolysis. 6 tables, 3 figures, and 6 footnotes. E.S.

CELLULOSE ETHERS

TIMELL, TORE. Cellulose reactions XIII. The distribution of the substituents in some highly-substituted cellulose ethers. Svensk Kem. Tid. 62, no. 2: 49-60 (1950). [In English]

The author has previously investigated the distribution of the substituent groups in cellulose ethers with a degree of substitution (D.S.) below 2.0 (*cf.* B.I.P.C. 18: 741-2). In the present work the study has been extended to include three higher-substituted ethers, one a fibrous methylcellulose with a D.S. of 2.29, and two commercial ethylcelluloses with D.S. 2.32 and 2.48. The distribution of the substituents was calculated from the results of experimental methods described in an earlier section (*cf.* B.I.P.C. 18: 506-7). From the rate constants of the different hydroxyl groups, k_2, k_3, and k_6, assuming k_3 equal to 1, the following ratios are obtained: Methylcellulose sample I, 2.55:1:1.97; ethylcellulose sample II, 2.85:1:2.73; ethylcellulose sample III, 2.54:1:2.54. As with lower-substituted ethers, the hydroxyl in the 3-position is the least reactive. However, with the present samples the reactivity of the 2-hydroxyl has become about equal to that of the primary 6-hydroxyl, although in the lower substituted ethers the activity of the primary hydroxyl is definitely greater. These findings are supported by the earlier investigation by Mahoney and Purves (*cf.* B.I.P.C. 12: 177) of an ethylcellulose with the same average D.S. as sample III. Although the ratio of the reactivity of the 2- and 6-hydroxyls to the 3-hydroxyl was not as great, the reactivity of the 2-hydroxyl was nearly the same as that of the 6-hydroxyl. It is concluded that the reaction of the primary hydroxyl group is interfered with at higher degrees of substitution, and it has been suggested by previous investigators, as well as the author, that particularly strong hydrogen bonds are involved. Comparing the distribution of substituents with the statistically calculated values, it is found that in all three cases the analytically determined number of glycol groups is considerably lower than the calculated number. This is attributed to steric considerations. In other respects the agreement between the actual and the calculated values is fairly good, indicating that the substituents are uniformly distributed and that the reaction is permutoidal in nature, approaching a more or less homogeneous reaction during the later stages with the commercial samples. 21 tables and 12 references. E.S.

CHEMICAL TESTING—CELLULOSE

AMERICAN OIL CHEMISTS' SOCIETY. *Cellulose Yield Committee.* Report of the Cellulose Yield Committee, April 1950. J. Am. Oil Chemists' Soc. 27, no. 6: 210 (June, 1950); *cf.* B.I.P.C. 19: 763.

The analyses of the 10 co-operating laboratories are tabulated and show a very good over-all average; it is recommended that samples be sent out at least four times during the next year. 1 table. E.S.

CHEMICAL TESTING—SULFITE WASTE LIQUOR

LAGERSTRÖM, OLOF, and SAMUELSON, OLOF. Determination of phosphate in sulfite waste liquor. Svensk Papperstidn. 53, no. 7: 183-4 (April 15, 1950). [In English; German and Swedish summaries]

A colorimetric method for the determination of phosphate in sulfite waste liquor is described. The liquor is filtered through a layer of hydrogen cation exchanger (Wofatit KS) to remove calcium and ferrous ions. After neutralization with sodium carbonate, the filtrate is evaporated to dryness and ashed at 600° C. Hydrofluoric acid is added to the ash to remove silica, and the sample is evaporated on a water bath; the residue is fused with sodium and potassium carbonate. Ammonium vanadate and ammonium molybdate solutions are added, and the phosphate is determined colorimetrically as molybdovanadophosphoric acid. Different sulfite waste liquor samples were analyzed; the Swedish samples had a phosphate content of 9-12 mg. per liter, a Canadian sample about the same, and a liquor sample from the American Pacific Coast about five times this amount. 2 tables, 1 diagram, and 4 references. E.S.

CHEMICALS

INDUSTRIAL AND ENGINEERING CHEMISTRY. Facts and figures for the chemical process industries. Ind. Eng. Chem. 42, no. 6: 936-1006 (June, 1950); *cf.* B.I.P.C. 18: 744-5.

The report consists of the following individual sections, listed by authors and titles: Aries, Robert S., and Spence, John W. Economic and financial development of the chemical process industries, p. 936-47; Anon. 100 chemical process companies; an analysis of their financial records, 1939-1949, p. 948-73; Crass, M. F., Jr. Postwar record good—future bright but . . . , p. 974-7; Merrill, C. W. Metallic minerals and metals, p. 978-80; Josephson, G. W. Nonmetallic minerals, p. 980-2; Hunter, T. W. Mineral fuels, p. 982-3; Talbot, Frank. Inorganic chemicals, p. 984-9; Hibben, J. H. Organic chemicals, p. 990-1001; and Concannon, C. C. Foreign trade, p. 1002-6. Statistical tabulated data and numerous charts are included; frequent reference is made to the pulp and paper industry and to some of its companies. E.S.

SHALLCROSS, RUTH E. New supply-demand data. Tappi 33, no. 6: 82-3A (June, 1950); *cf.* B.I.P.C. 20: 239, 310, 422.

Additional data for 1947-49 are given, to the extent that they have become available. E.S.

CHROMATOGRAPHY

BROCKMANN, H. Chromatography of colourless substances and the relation between constitution and adsorption affinity. Discussions Faraday Soc. 7: 58-64 (1949).

A method for the chromatographic separation of colorless substances based on the use of fluorescent absorbents is described. The relations between the adsorption affinity and chemical constitution of azobenzene and stilbene derivatives are demonstrated. The dependence of adsorption affinity on the nature

of the adsorbent and solvent was investigated. Water-soluble salts like copper sulfate or zinc sulfate were found to be useful adsorbents for the chromatographic separation of azobenzene compounds. 2 references. E.S.

BURSTALL, F. H., DAVIES, G. R., and WELLS, R. A. The use of columns of cellulose for the separation and determination of metals. Discussions Faraday Soc. 7: 179-83 (1949).

A process is described for the separation of inorganic materials on columns of a cellulose adsorbent with the aid of organic solvents. A method of preparation of a suitable cellulose pulp is given, together with a general description of the practical details of the process. The scope and applicability of the method are illustrated by a variety of separations which have been achieved; some of the factors influencing and producing the separations are considered. 1 table and 7 references. E.S.

HIRST, E. L., and JONES, J. K. N. The application of partition chromatography to the separation of the sugars and their derivatives. Discussions Faraday Soc. 7: 268-74 (1949).

An account is given of the various applications of chromatography to the separation of mixtures of sugars and sugar derivatives. Methods of partition chromatography on strips of filter paper and on cellulose columns with automatic devices for collecting fractions are described. The uses of special solvents and developing agents (giving specific color reactions) are discussed, and methods for the quantitative separation and determination of sugars on the micro scale are given. A list of R_θ values for various sugars is included and examples are quoted to show the special values of these methods in the investigation of naturally occurring polysaccharides. 2 tables and 53 references. E.S.

KOWKABANY, GEORGE N., and CASSIDY, HAROLD G. Investigation of paper strip chromatography. Anal. Chem. 22, no. 6: 817-19 (June, 1950).

The results are given of a comparison of 22 filter papers against five solvents in the separation of test mixtures of amino acids. The filter papers tested were from Reeve Angel (R.A.), Schleicher and Schuell (S.S.), and Whatman (W.). Except for R.A. 202, 226, and 220, all the papers appeared to be suitable, although to different degrees, for separating the amino acid mixtures; these three gave a high flow rate of developer, but the zones of amino acid were diffuse spots and streaks and showed poor separation under the conditions of the test. Taking W. 1 as a standard, a group of five papers (S.S. 507, 576, 589 Black, 589 Blue, and 589 White Ribbon) showed differences from the standard behavior. Of these five, S.S. 507 is probably the best for quantitative use, although the rate of movement of solvent in this paper is very slow. W. 3, which is thick, absorbent, and gives sharply resolved spots, is recommended as a generally useful paper. Where the desire for speed of analysis outweighs considerations of sharp separation and resolution of spots, papers S.S. 604, 598, and 589 Black Ribbon, over which the solvent moves 40 cm. in 6-8 hours, may be found useful. Supplementary tests were carried out using 53 industrial papers from the Eaton-Dikeman Company; 16 of these were compared with W. 1, and none were found superior to this paper. 1 table, 1 figure, and 16 references. J.A.B.

CONTACT ANGLE

BIKERMAN, J. J. Surface roughness and contact angle. J. Phys. & Colloid Chem. 54, no. 5: 653-8 (May, 1950).

A quantitative study of the relationship between surface roughness and wetting is described for the system stainless steel-water in air. The surface roughness of six standard sheet finishes of 18-8 stainless steel in terms of "root mean square elevations" were determined from microscopic measurements on drops of water placed on the plates. The results show that surface roughness has no definite effect on contact angle. 2 tables, 2 figures, and 4 references. J.O.T.

COST—ACCOUNTING

BURTON, LAURENCE B. Standardized cost accounting system for packaging cited as urgent need. Packaging Parade 18, no. 209: 56-7 (June, 1950).

The author maintains that for a correct analysis of an individual company's packaging costs in relation to advertising, promotion, and production factors, there must be standard definitions which all companies in the packaging industry follow. At present, such items as label expenses are listed as advertising or sales promotion costs by some companies and as packaging costs by others. Some points are mentioned for study in determining the items to include in packaging costs, and ways are suggested for reducing these costs. Packaging research programs are advocated. J.A.B.

MACK, HEINZ. Manufacture of paper and light and heavy boards. Allg. Papier-Rundschau no. 8: 378-84 (April 30, 1950). [In German]

Following a brief outline of the raw materials used in the paper and board industries, the manufacture of rag, wood-pulp, and straw paper and board and the required machinery are described. The article serves as a basis for standard cost accounting in the industry. The fixed costs amount to approximately 40-44%, depending upon the operating rate, and the variable costs to 56-60%. The industry is particularly sensitive to cuts in operation. The efficiency of a paper machine depends upon the basis weight of the particular grade produced, machine width and speed, operating hours, shutdowns, and broke. 5 illustrations. E.S.

PARIS, PAUL. The building-up of a cost accounting system. Allg. Papier-Rundschau no. 8: 374-8 (April 30, 1950). [In German]

The fundamentals of cost accounting in the paper industry are discussed; the desirability of a standard cost system—to be developed by the technical association—is pointed out. 3 diagrams. E.S.

DIELECTRICS—TESTING

CALKINS, CHARLES R. Studies of dielectric properties of chemical pulps. III. Dielectric properties of cellulose. Tappi 33, no. 6: 278-85 (June, 1950); *cf.* B.I.P.C. 16: 280.

A test capacitor embodying several desirable features has been designed and constructed for use with a Schering bridge. The loss angle and dielectric constant of native cellulose have been measured at frequencies from 500 to 4000 cycles per second at temperatures from 25 to 105° C., under conditions that assure no inaccuracy as a consequence of the presence of moisture. The observed behavior can be adequately explained if cellulose is regarded as a heterogeneous linear polymer with many polar groups. Similar measurements with regenerated celluloses showed significant increases in both loss angle and dielectric constant as compared with native cellulose. When these celluloses are subjected to moderate pressures, these values are reduced. A possible

relationship between the observed dielectric constant and amorphous cellulose content (estimated by moisture regain) was found. However, the evidence is contradictory (a presumably amorphous cellophane was comparable with native cellulose), and no definite conclusions may yet be drawn. 9 tables, 7 figures, and 30 references. E.S.

DIESEL ENGINES

TOMCZAK, S. E. What we have learned about Diesel engines. Paper Trade J. 130, no. 24: 83-4 (June 15, 1950).

The generated power of the Flambeau Paper Division of The Kansas City Star Co. is principally hydroelectric. Precipitation in recent years was below average; to prevent curtailment of production two Diesel-driven generators were installed. Operating data and costs of the Diesels are given, and essential maintenance work is described. The experience with the units is satisfactory; in addition, they permit the storing of water in spring and an increase in stream flow during the hot summer months, thereby reducing stream pollution and improving river conditions. E.S.

EVAPORATION AND EVAPORATORS—SULFITE WASTE LIQUOR

ROSENBLAD, CURT. Evaporation of waste sulphite liquor. Pulp Paper Mag. Can. 51, no. 6: 85-94 (May, 1950).

The general conditions for the evaporation of sulfite waste liquor are described. The two important factors in economical evaporation are the high concentration of the initial liquor in the digester and the limitation of the dilution of the liquor to the evaporator. The heat economy realized through evaporation is discussed. The multiple-effect evaporator is the common type; but the most economical, taking total heat and power consumption into consideration, are the counter-pressure and the recompression evaporators. Both types can be used advantageously if the evaporation is carried out above atmospheric pressure. The surprising decrease in the power required by the latter (when changing from vacuum to pressure) is illustrated in a diagram. Evaporation at high temperatures and pressure is possible if the scaling problem is solved. The switching method, the control of the washing procedures, and methods for determining the length of the periods between switching are described. Operating data for four evaporators, installed in different Swedish mills, and the results obtained from three of these, covering the latest available reports for a six months' period or longer, are given. The incrustation which built up after a long period of operation in parts of the system in which periodic switching was not arranged is shown in a few pictures. From experience gained where the evaporators have been in operation a long time, so-called "station switching" has been developed. Every part in contact with the liquor or vapor (piping, pumps, and tanks) is subjected to switching and washing in the same manner as the heating surfaces. Results are given for the mills which burn the liquor. Since these installations are of a rather small capacity, the combustion and ash problem has not been serious. 1 table and 10 figures. E.S.

FIBER—SURFACE AREA

CALKINS, EDWARD W. S. Some comparisons of fiber "fineness" measurements. Textile Research J. 20, no. 6: 426-33 (June, 1950).

Interlaboratory check tests show an excellent correlation between the United States Rubber Co.'s homemade air-permeability instrument and both the University of Tennessee's "Arealometer" and an air-permeability instrument in another laboratory. From similar results reported by other investiga-

tors for their own instruments, it is concluded that any instrument of this type, if properly calibrated, can do a good job of measuring surface area. A comparison of data found in the literature on normal fiber perimeter, wall thickness, surface area, and weight per inch with calculated values indicates that all laboratory measurements of fiber dimensions are surprisingly accurate and consistent. Drawings of fiber cross sections with various combinations of dimensions indicate that fibers with the same surface area are most alike in appearance and ought to be more alike in their spinning behavior than those selected for uniformity by any other fineness measurement. A chart is given from which any two of the four fineness variables can be read if the other two are known. It is shown that fibers of the same surface area may vary widely in weight per inch, and that no conversion from surface area to weight per inch can be accurate unless one other variable is held constant. This may be either wall thickness, fiber diameter, or their ratio, usually called "maturity." 4 tables and 5 figures. E.S.

FIBER—TESTING

BROWN, HUGH M., and GRAHAM, JOHN S. Measurement of fineness of cotton by air-flow methods. Textile Research J. 20, no. 6: 418-25 (June, 1950).

Using seven varieties of cotton harvested at different times to give an extremely wide range in fiber development, a study was made of the air-flow method of measuring fineness and maturity of the lint. The data show that when porosity meters are calibrated in units of weight per unit length of fiber (i.e., fineness), the curves for different varieties of cotton are quite different. This is caused by the fact that resistance to air flow through a fiber plug correlates more closely with the surface area of the fibers composing the plug than with their fineness. This surface area varies with variety and maturity, independently of the fineness of the cotton. The use of a plug of constant weight and volume made of fibers having a constant density permits the application of a simple theory which predicts essentially the actual variation of air flow with both variety and maturity of the cottons tested. Two quite different types of air-flow instruments are shown to give similar results that are more consistent with the specific surface of the several cottons than with the fineness of the fibers. For several cottons, the air-flow data published by the U. S. Department of Agriculture for the 1948 crop are compared with the previous ten-year averages for fineness which had been measured by counting and weighing the fibers. 2 tables, 9 figures, and 6 references. E.S.

FOLDING BOXES

CARTWRIGHT, R. B. Cut finger inspires pouring spout invention. Packaging Parade 18, no. 209: 43 (June, 1950).

A new type of folding carton with a built-in pouring spout is described, and diagrams of the proposed production procedure are given. Cut scoring on the upper end of one side panel of the package produces the spout, which is pulled out for use, then springs back in place. It is also suggested that inner bags and overwraps be eliminated by coating the inner surface of carton blanks with a thermoplastic. 8 diagrams. J.A.B.

FORCED CIRCULATION

WILCOX, J. M. Circulation systems and sulphite pulping. Tappi 33, no. 6: 272-5 (June, 1950).

The results of a questionnaire sent to 105 sulfite pulp mills in the United States and Canada and answered by 82 mills show that a much larger per-

centage of production is made using circulation, both with and without external heaters. The percentage is higher for those mills which sell all or part of their pulp. Also, the percentage is higher for the mills producing the higher grades of pulp. A tabulation summarizing the results of the questionnaire is presented. A study is made between two bleached sulfite mills, comparing operation and results using circulation with direct and indirect cooking. The need for circulation in producing high-yield pulps is stressed. Several factors affect strainer design and location, as well as proper circulating pump operating characteristics. 1 table. E.S.

FOREST FIRES

ANON. Quebec limit holders protect forests. Pulp Paper Mag. Can. 51, no. 6: 115-16, 118 (May, 1950).

The highlights of the following association reports are presented: The Laurentian Forest Protective Association Limited, the Ottawa River Forest Protective Association Limited, the Price Brothers Forest Protective Association Limited, and the Southern St. Lawrence Forest Protective Association. E.S.

BOYLE, A. A. Crew and camp organization on the actual fire line. Pulp Paper Mag. Can. 51, no. 6: 132, 134 (May, 1950).

Directions are given for the organization of crews and camps at the scene of a large fire. E.S.

CANADIAN FORESTRY ASSOCIATION. Forest fire facts surveyed by Canadian Forestry Association. Pulp Paper Mag. Can. 51, no. 6: 120, 122, 124 (May, 1950).

The Canadian forest-fire losses, the general situation, and needs and means for reducing the crippling fires are reviewed. The public is the main culprit in causing the tremendous losses; in some provinces, the travel-permit system has been found effective. Another important factor is the need for access roads. If reached within one hour, 75% of the forest fires will not go past the 10-acre mark; however, if the time elapsed is 24 hours, over 13% reach the 1000-acre size. E.S.

MCCOLL, B. J. Power pumps for forest fire fighting. Pulp Paper Mag. Can. 51, no. 6: 126, 128, 130 (May, 1950).

A brief description is given of currently available high-pressure pumps of the portable type. E.S.

PULP AND PAPER MAGAZINE OF CANADA. Forest fire situation reviewed by provincial authorities. Pulp Paper Mag. Can. 51, no. 6: 108-12, 114 (May, 1950).

The following brief reviews are presented, listed by authors and titles: Dyer, D. A. S. Prevention, detection and suppression of forest fires in Nova Scotia—1949, p. 108; Kieffer, Henri. Forest protection in Quebec, p. 109-10; MacKey, T. E. Recent experiences in fire protection in Ontario, p. 110-11; Stephens, D. M. Forest fire protection—Manitoba, p. 111-12; and Huestis, E. S. Alberta's forest fire experiences, p. 112, 114. E.S.

FORESTS AND FORESTRY

ANON. New Zealand forestry. Indian Pulp and Paper 4, no. 9: 382-3 (March, 1950).

New Zealand is not rich in indigenous forests, but a new wealth has sprung up in the form of *Pinus insignis* and other exotic trees, and forestry promises to become one of the country's largest industries. Because of the rapidity of growth, every effort is being made to develop an export trade, preferably with Australia. The government controls 300,000 acres of forest area, and most of the remainder is owned by two private companies—New Zealand Forest Products Ltd. and Whakatane Board Mills Ltd. A brief history is given of these companies and of the industry. J.A.B.

LANGSOETER, A. Forestry in the national economy of Norway, particularly that of the rural districts. Norsk Skogind. 4, no. 3: 56-62 (March, 1950). [In Norwegian; English summary]

About 55% of the Norwegian forests are owned by farmers, 20% by the state or communities, and 25% by industry. The accessible yearly increment is estimated at 10.2 million cu. m., of which about 3.2 million cu. m. are used as fuel, so that approximately 7 million cu. m. (6.8-6.9 million cu. m. of coniferous wood) are available for industrial purposes. However, there is a shortage of younger stands and, in order to avoid a serious timber deficit in the future, the author emphasizes the need for cutting less than the annual increment (about 6 million cu. m.) in the coming years. Industry should convert more waste from the sawmills and hitherto unused tree species. Conflicting interests of farmers and foresters and their solution are also discussed. E.S.

HEAT

EDLING, G. Heat balance for three types of pulp mills. Paper Ind. 32, no. 2: 192, 194, 196; no. 3: 316-18 (May, June, 1950); *cf.* B.I.P.C. 19: 26.

This is a complete translation of the Swedish article.

E.S.

HISTORY

ANON. Third report of the "Forschungstelle Papiergeschichte" at the Gutenberg Museum in Mainz (Mayence). Das Papier 4, no. 7/8: 118-20 (April, 1950). [In German]

The activities of the research center of paper history for the period 1941-49 inclusive are reviewed, with particular reference to the watermark collection. A list of recent important publications on historical subjects of the industry is included. E.S.

B[OCKWITZ] H. H. Documents of paper history; a French explorer of the 18th century discusses the writing materials of India. Wochbl. Papierfabr. 78, no. 9: 251 (May 15, 1950). [In German]

Reference is made to the description of the travels of the French explorer, Pierre Sonnerat, in East India and China from 1774 to 1781, and an excerpt concerning Indian writing materials is given. The Indians of that time used "Olles" prepared from the leaves of the Palmyra and Corypha palms; for writing, the writer placed a leaf on one hand and used a graver or burin with the other. Paper made from linen and cotton rags and sized with ricestarch was also known, although apparently not for very long, because all old books were written on palm leaves. 1 illustration. E.S.

INSURANCE, FIRE

WRIGHT, W. G. Forest fires insurance in eastern Canada. Pulp Paper Mag. Can. 51, no. 6: 136, 138-40 (May, 1950); *cf.* B.I.P.C. 20: 246.

Work is now in progress to organize a joint stock company to provide forest-fire insurance for standing timber in Eastern Canada on a mutual basis, with each stockholder in the company a policyholder, and policyholders sharing in the profits. The question of values and losses of standing timber receives consideration in the present article. The available 20-year record shows that the burning ratio on an area basis is substantially higher for reproducing areas than for standing timber; in organizing the new forest-fire insurance, it seems therefore desirable to confine the insurance in the beginning to standing timber. E.S.

JUTE

SARKAR, P. B., MAZUMDAR, A. K., and PAL, K. B. Association of xylan with α-cellulose in jute. Nature 165, no. 4205: 897-8 (June 3, 1950); *cf.* B.I.P.C. 18: 595-6.

Confirming their previous findings, the authors found that the α-cellulose isolated from chlorite holocellulose contains no xylose units. This was evidenced by complete acid hydrolysis of the α-cellulose, followed by neutralization with barium carbonate and by subjection of the concentrated filtrate to paper-partition chromatography. No xylose spot appeared on the paper chromatogram; only glucose was present. 1 figure and 8 references. L.E.W.

KRAFT PULP AND PAPER

SAWYER, FREDERICK G., BEALS, CHESTER T., and NEUBAUER, ARTHUR W. Kraft papermaking. Ind. Eng. Chem. 42, no. 6: 1007-20 (June, 1950); *cf.* B.I.P.C. 20: 700.

The process of making kraft paper for bag, wrapping, and specialty grades at the Camas mill of the Crown Zellerbach Corp. is described in detail, including the storage of pulp and screening, bleaching, beating and refining, the flow of the stock over the paper machine, white water and broke recovery, moisture control, instrumentation, and control data. 5 tables, 16 figures (including one flowsheet of the papermaking process), and 63 references. E.S.

LACQUER AND LACQUERING

COLLINS, T. T., JR. Wax solubilities . . . addendum. Paper Ind. 32, no. 3: 282 (June, 1950); *cf.* B.I.P.C. 20: 642.

The tabular, explanatory legend for two of the figures in the previous reference was not included and is presented herewith. E.S.

LIGNIN

ERDTMAN, HOLGER, LINDGREN, BENGT O., and PETTERSSON, TAGE. Studies on the sulfonation of lignin. I. Acta Chem. Scand. 4, no. 2: 228-38 (1950). [In English]

Calcium lignosulfonates (with 4.19% sulfur content in the barium salt) have been resulfonated stepwise, giving barium lignosulfonates with 5.74 and 8.24% sulfur contents. By converting these lignosulfonates into their

pyridinium salts, acetylating them, and determining the acetyl content, it is concluded that about one hydroxyl group disappears for each sulfonic acid group introduced into the low-sulfonated lignosulfonic acid. 4 tables and 16 references. F.E.B.

RICHTZENHAIN, H. The oxidative degradation of alcohol lignin. Acta Chem. Scand. 4, no. 1: 206 (1950). [In German]

The oxidation of a dimethyl sulfate-methylated ethanol lignin according to Freudenberg gave 1.3% metahemipinic acid and 1.5% succinic acid, in addition to 9.2% veratric, 0.5% dehydrodiveratric, and 0.95% isohemipinic acids. According to the author, this finding necessitates a reconsideration of the present view of the structure of lignin. 4 references. F.E.B.

LIGNITE

SCHULZE, REINHARD. Efficiency increase of lignite boilers through reconstruction of the furnaces. Wochbl. Papierfabr. 78, no. 10: 271-4 (May 31, 1950). [In German]

The reconstruction and modernization of the furnaces of two lignite boilers are described; large open fireplaces without separating walls or other screening installations and correctly constructed suspended ceilings resulted in an increase of about 34-40% in capacity and 6-7% in efficiency. 2 tables and 7 figures. E.S.

LIME AND LIMESTONE

MARTIN-LÖF, R. Reburning of lime sludge. Svensk Papperstidn. 53, no. 5: 121-6 (March 15, 1950). [In Swedish; English summary]

The plant for reburning the lime sludge at Karlsborgsverken is described. The rotary kiln is heated by producer gas from wood waste, dried to 8-10% moisture in a rotary drier by the waste gas from the kiln. The sludge after filtering is about 55% dry. The temperature in the furnace amounts to 1100-1200° C., and that of the waste gas to about 250-300°. On an average, the reburnt lime contains 78-80% calcium oxide and 6-8% calcium carbonate. The output of the kiln is 30 metric tons per day, requiring an equivalent of 430 kg. coal/ton of lime. A heat balance indicates that 31% is used for drying the sludge, 22% for heating and burning, 8% is lost with the lime and 15% by radiation, 10% is used for drying the fuel, and 14% is lost in the waste gas from the drier. The heat losses are the weak point of the system. However, a comparison of the cost of production of lime from sludge and from limestone shows that the former amounts to 41 Swedish crowns, and the latter to 78 Swedish crowns per ton of lime. 3 tables and 2 diagrams. E.S.

MACHINERY—BEARINGS

WESTBROOK, U. J. Maintenance of anti-friction bearings in paper machine dryer sections. Paper Mill News 73, no. 24: 82 (June 17, 1950); Paper Trade J. 130, no. 24: 74 (June 17, 1950); Paper Ind. 32, no. 4: 432 (July, 1950).

The author discusses the problems in the care and maintenance of anti-friction bearings in high-speed driers, which have a life expectancy of 10 years. Accessibility for inspection and replacement is a prime requisite; proper lubrication is another. A thorough study of the machine should be made before recommending a lubricant; the section of the country in which the machine is located also makes a difference. Proper bearing maintenance

results from the co-operation of the operators, the machine constructor, the bearing manufacturer, the lubricating engineer, and the oiler. E.S.

MACHINERY—BEATERS

ROBERTS, MILTON R. The operation of the multiroll beater. Tappi 33, no. 6: 286-8; discussion: 288 (June, 1950); *cf.* B.I.P.C. 20: 718.

The beater-type refiner is a triple-roll beater in which the stock is treated continuously. The control is maintained through pressure adjustments of the bedplates. In the conventional batch system the bedplate is stationary with a small amount of roll pressure adjustment. In the triple-roll beater the bedplates are supported during operation by six cylinders exerting a pressure of 0 to 300 p.s.i. Pressure variations have a direct bearing on the effect of treatment. The stock flow is introduced through flow spreaders in front of the first roll. This level is constant during operation, and safety features are incorporated in the design to prevent damage to the rolls or bedplates in event of flow failure. Tests conducted over a six-month period of operation show the beater to have the effect and flexibility for which it was designed. During the period of operation no signs of wear appeared on the bars and no down time was recorded for maintenance. Data are given to substantiate the increase of quality caused by the beater, and data from paper-machine records prior to and after beater installation show the difference in quality of paper made from beater-treated fiber. A study of the six-month operating period indicates the effectiveness of the beater for treating southern kraft stock. Further studies under different conditions will be made and presented to the industry at a later date. 1 diagram. E.S.

MACHINERY—BELTING

RUMBLE, FRANK H. Short center V-belt drives for economy and compactness. Southern Pulp Paper Manuf. 13, no. 6: 34 (June, 1950).

A chart is presented for determining the ideal center distance of a V-belt drive; directions for its use are given. 1 graph. E.S.

MACHINERY—CENTRIFUGAL SCREENS

WHITE, W. A., JR. Development of the Hydraclone. Paper Trade J. 130, no. 24: 76, 78-83 (June 15, 1950).

The present trend in the paper industry is toward the use of more reclaimed papers and less virgin pulps, wherever possible. The standards for the finished sheet of paper are being raised continually to the point where dirt, grit, and other foreign materials must be virtually eliminated for the product to be acceptable. The Hydraclone separator is a centrifugal velocity-type unit, which is unique in design and which utilizes centrifugal force as the separating means, causing foreign material of a greater specific gravity than water to be thrown out of suspension. The basic principles of settling and centrifugal separation and the details of the Hydraclone design are described. The unit is designed to operate on a straight flow-through principle with no reverse flow condition to set up harmful turbulence; it has been designed in three sizes having capacities of 250, 500, and 1000 gallons per minute. It is economically beneficial for any mill using a mixed paper furnish to install a Hydraclone directly after their breaker beater or Hydrapulper to clean up their furnish as far back in the system as possible. 17 figures and 2 references. E.S.

MACHINERY—CHIPPERS

MCLAREN, C. G., and BURGY, MARLOWE P. Portable chipper in woods operation. Paper Trade J. 130, no. 26: 25-7 (June 29, 1950); *cf.* B.I.P.C. 20: 403-4.

A description is given which is similar to the one in the previous reference. 6 illustrations. E.S.

MACHINERY—FELTS

BUCKMAN, STANLEY J. Performance of paper machine wet felts. I. Preliminary microscopic observations of the effect of micro-organisms on the plugging of felts. Tappi 33, no. 6: 291-4 (June, 1950).

A method is described for embedding specimens of paper-machine wet felts, which is an adaptation of a similar method employed for textiles. The felt specimens were embedded within one hour after removal from the paper machine, or were refrigerated until embedded, to prevent any significant additional growth of micro-organisms. The only treatment of the felt specimens prior to embedding consisted of the removal of excess water by pressing the specimens between pieces of blotting paper. Deposits in the used wet felts were preserved in the state in which they existed at the time of removal from the paper machines by impregnation of the specimens with a low-viscosity solution of methyl methacrylate monomer, plasticizer, and catalyst, followed by heating at 53° C. to polymerize the resin. Sections 30 μ in thickness were prepared for microscopic examination with a sliding microtome. Unstained sections were mounted directly in Canada balsam and safranin-stained sections were mounted in the same medium after a minimum of preparatory treatment. A comparison of unstained and stained sections showed the deposits in the felts were not significantly disturbed by the staining procedure which aided in differentiation. Sections from used wet felts employed during the production of newsprint, kraft, and fine papers showed the presence of masses of capsulated bacteria which filled the spaces between the felt fibers to varying degrees. Photomicrographs of a number of sections are presented. The study is being extended to include a large number of used wet felts which have been employed for the production of different kinds of paper under the range of conditions encountered in the paper industry. 6 figures and 7 references. E.S.

MACHINERY—MIXING APPARATUS

SMITH, JULIAN C. Mixers for pastes and powders. Chem. Inds. 66, no. 6: 843-50, 921, 945 (June, 1950); *cf.* B.I.P.C. 19: 557.

This report is a supplement to the previous one on agitators for liquids; although a clear distinction cannot always be made, the present report covers the mixing of substances that are too thick to be circulated by a turbine or propeller agitator. Equipment for blending semisolids, pastes, and powders fall into one of four classes: tank agitators for thick liquids and pastes; mixers for pastes and dry powders; kneaders, dispersers, and masticators for heavy pastes and tough rubbery masses; and blenders for dry powders. Representatives of each group and special mixers are described; a list of manufacturers is included in tabular form. 2 tables, 11 illustrations, and 10 references. E.S.

MACHINERY—PAPER MACHINE

ANON. Fort Frances rebuilds No. 6 machine. Can. Pulp Paper Ind. 3, no. 6: 18, 20, 22 (June, 1950); *cf.* B.I.P.C. 20: 250.

The old No. 6 newsprint machine, one of the two original machines installed at the Fort Frances, Ont. mill of the Minnesota and Ontario Paper Co., was completely rebuilt to make possible the production of a greater diversity of papers. The remodeling involved portions of the wet end, press section, driers, the reel, and the winder; a sectional electric drive of the latest type replaces the old belt-driven, reciprocating-engine steam drive. One month after the machine was shut down, the big new revamped unit went back into production. Approximately 10 tons per day have been added to the machine's capacity. The new drive gives it a speed range of from 200 to 1000 ft./min., so that it is now capable of producing any weight of paper from 32 to 70 pounds basis. 3 illustrations. E.S.

MACHINERY—PRESSES

HERMAN, LESTER F. Use of a roll-type fiber press on straw. Tappi 33, no. 6: 262-3 (June, 1950).

The application of the Fulton three-roll press for chopping straw is described; the press flattens the straw and crushes the nodes, rachises, and large weeds. As a result, the charge in the rotary digester can be increased about 30%. The press is also very efficient in removing the black liquor from pulped straw and other pulps, directly after the digester; the pulp sheet emerges from the press with a dry content of approximately 50%. 2 tables. E.S.

MACHINERY—REFINERS

EBERHARDT, LEE E. The use of disc refiners in the sulphite mill. Paper Trade J. 130, no. 25: 21-4, 26 (June 22, 1950); Paper Mill News 73, no. 30: 10-13 (July 29, 1950); *cf.* B.I.P.C. 18: 623.

The design and operation of modern disk mills are described. The selection of a refiner must be predicated upon actual experience with a commercial-sized machine; the quality of the pulp produced can vary widely in accordance with different treatments. The principal variables are: number of rotating disks, rate of power application, speed of rotation, consistency of feed, pattern of fiberizing plates, distance between the plates, and precision of construction. Applications of single and double disk refiners or mills in sulfite mills are described, including the preliminary treatment of chips and pulps, semichemical pulps, refining of screenings and rejects, stock preparation and dirt dispersal, and laboratory applications. 3 tables and 11 figures. E.S.

MACHINERY—SAVE-ALLS

EASTON, PAUL, and BAUM, ROBERT. White water recovery by a flotation method; operation of the Sveen Pedersen saveall. Tappi 33, no. 6: 301-4; discussion: 304 (June, 1950).

The theory of operation of the Sveen Pedersen flotation saveall is briefly discussed. Efficient reclamation of papermaking fibers and raw materials from white waters is obtained by dissolving air in the process flow under pressure and subsequently releasing it to atmosphere. The air is allowed to come out of solution during the induced flocculation of fibers and raw materials by suitable colloidally active flocculation aids. The flotation force obtained by this means enables a high-density recovery of raw materials for return to the process. Clarified water is withdrawn from below the floated fibers and is suitable for showers and other uses (to conform with pollution regulations). The effect of proper flocculation of materials to be separated by the dissolved-air process is discussed, and its role in attaining efficient

flotation described. It is suggested that papermaking fibers in water suspension follow certain phenomena common to carbohydrate colloids, and their flocculation may be economically controlled by colloidally active materials such as glue, silica, resins, etc., in amounts as low as a few parts per million. 6 references. E.S.

MARKET RESEARCH

ANON. "Prepackaging at source" for long shipment successful in second test. Packaging Parade 18, no. 209: 59 (June, 1950); Modern Packaging 23, no. 10: 124 (June, 1950); *cf.* B.I.P.C. 20: 573.

A second test shipment of fresh asparagus prepackaged in Lumarith (cellulose acetate film) in one-pound bunches, 30 packages in each conventional pyramid crate, was sent from California to Chicago and New York in express cars cooled by bumper ice for distribution by The Great Atlantic and Pacific Tea Co. The consumer reaction was so favorable that similar "source packaging" may be adopted as a permanent operation. E.S.

ROBBINS, B. C. What the consumer thinks about self-service meat. Fibre Containers 35, no. 6: 108, 110 (June, 1950).

The results of a survey are presented, which reveal that 51.1% of the buyers of prepackaged meat (3419 families in 11 cities) are favorably inclined toward becoming regular purchasers. The reasons for first purchases, likes, and dislikes are presented in tabular form. Dissatisfaction seems to center around the fear that the meat is not too fresh, that the packages conceal waste, that the board hides the number of slices, and that the paperboard absorbs the juices and results in tough meats after standing for some time. E.S.

MATERIALS HANDLING

BUTLER, WILLIAM F. Material handling. Paper Mill News 73, no. 23: 25, 28 (June 10, 1950).

The author stresses the desirability of co-ordinating all phases of material handling into one program; the consultant is available to assist larger and smaller organizations in the establishment of such a program and can be of very real assistance, where only the part-time service of an experienced individual is required for working out the details. E.S.

MILL MANAGEMENT

BARTHELEMY, E. P. Duties of supervisors; foreman's responsibility outlined. Pulp & Paper 24, no. 7: 96, 99 (June, 1950).

Crown Zellerbach's job-instruction training program started with an outline of the duties and responsibilities of the foreman down the line to the backtenders; lists of these duties are given. E.S.

CAMERON, D. EWEN. Psychiatry in industry. Pulp Paper Mag. Can. 51, no. 6: 79 (May, 1950).

Brief reference is made to the possibilities of psychiatry in industry for obtaining better solutions of social problems. E.S.

FAIR, A. E. The superintendent's function in research and technical control. Paper Mill News 73, no. 24: 97-8 (June 17, 1950).

The scope of the superintendent's activities is no longer restricted to machine operations, but includes engineering, technical, and administrative fields. There is no need to urge the acceptance of control and research by the superintendent, because this has already become a fact. However, there appears to be some scope for the closer blending of the operating and technical departments. E.S.

MOORE, JAMES D. A valuable technique . . . job evaluation. Shears 68, no. 690: 20-2, 65 (June, 1950).

A great many labor troubles may be prevented by job evaluation, which is the detailed, skillful analysis of all jobs by breaking them down into their component parts and measuring them with a yardstick or manual employing terms understood by all persons involved. A special committee of the Folding Paper Box Association of America devised such a manual in 1938, as well as complete descriptions and definitions of every function in a folding box plant. The use of job evaluations facilitates the selection of employees, aids in the resolution of grievances, and increases general morale. A suggested procedure is given for setting up such a program. J.A.B.

SPENCER, JOHN A. Some hopeful experiments in industrial and community relations. Paper Trade J. 130, no. 24: 68, 70, 72 (June 15, 1950).

The author discusses the industrial relations program of the General Electric Co., with particular reference to certain experiments, such as training the boss at all levels of management, education in economics, messages to employees, management information conferences, and employee round tables. E.S.

TERBORGH, GEORGE. Machines and productivity. Southern Pulp Paper Manuf. 13, no. 6: 56, 58, 60 (June, 1950).

The author discusses the formulation and administration of re-equipment policy, which is a continuous and timely transformation of the installed facilities to hold the lag behind the best currently available to the lowest, economically justifiable limits. The two basic requirements for this task are a reliable analytical technique for appraising the replacement of equipment and a good administrative setup to give the responsible officials current and systematic information on the state of equipment inventory and on legitimate re-equipment opportunities. The importance of these requirements and the influence of lack of capital on these two factors are discussed. E.S.

WHITLOCK, JOHN B. Maintenance organization and management—a case from manufacturing. Southern Pulp Paper Manuf. 13, no. 6: 28, 32, 34 (June, 1950); *cf.* B.I.P.C. 20: 575.

The author describes the maintenance program and organization of the Armco Steel Corp., which centers around preventive maintenance. The five points included in this program involve an efficient, well-organized crew, a sound inspection system, a comprehensive study of material application, controlled lubrication, and training. E.S.

WINSTON, C. C., and HAMLIN, S. C. How to plan paper mill maintenance. Paper Ind. 32, no. 3: 281-2 (June, 1950); *cf.* B.I.P.C. 20: 723.

Even in the best maintained mills, rush or emergency jobs occur which are

caused by breakdowns or process changes. The number of these jobs varies from week to week, and the very fact that they occur leads most maintenance people to believe that no planning can be done. The authors show that planning one full day's work ahead can and should be done. They outline a procedure for analyzing and estimating jobs, preferably with the aid of a project type of Gantt chart, which will allow rush jobs to be inserted with the least disturbance to assigned work. Benefits from proper planning include more useful work from the crew, better relations with the production department, and reduced down time. 3 sample charts. E.S.

MOTION STUDIES

LIEGEL, LUDWIG. Introduction to the time and motion studies according to REFA (Regional Association for Work Studies). Allg. Papier-Rundschau no. 9: 449-55 (May 15, 1950). [In German]

The author discusses the significance and fundamentals of time and motion studies, supplemented by practical examples. These studies are then evaluated to form the basis for an equitable job evaluation and fixing of wages. A sample of the form used by REFA (3 pages) is included. 2 figures. E.S.

PARIS, PAUL. The preparation of tables and curves from time studies in the boxmaking industry. Allg. Papier-Rundschau no. 10: 498-502 (May 30, 1950). [In German]

The author describes the preparation of tables and graphs from data collected in time studies in the boxmaking industry. 10 tables and 2 graphs. E.S.

PARIS, PAUL. REFA and the boxmaking industry. Allg. Papier-Rundschau no. 9: 456-8 (May 15, 1950). [In German]

The author describes his method for introducing time and motion studies in a box factory and the actual measurements and their evaluation. E.S.

PARIS, PAUL. Time studies in the boxmaking industry. Allg. Papier-Rundschau no. 10: 493-8 (May 30, 1950). [In German]

The author describes various time studies which are used in the board-converting industry for the improvement of machinery construction or the mode of operations. E.S.

ODOR TROUBLE—PAPER

SJÖSTRÖM, LOREN B. Odors in relation to paper products and packaging. Tappi 33, no. 6: 58A, 60A (June, 1950); Fibre Containers 35, no. 7: 84, 86 (July, 1950).

For a paper product to give odor, a chemical substance must occur, generally solid in nature, which volatilizes into the gaseous phase and is picked up by the nose receptors for recognition. Odors found in paper products may be grouped into three very general classifications: general pulp odors, odors produced in manufacturing, and added odors. Routine tests for detecting odors are described, which are used in the Flavor Laboratory of Arthur D. Little. A table is included, listing typical off-odors found in paper products and their sources. Paper need not have objectionable odors; if it does, they have been added between pulping and final use, and adequate measures have not been taken to prevent them. Precautions for avoiding odors in paper manufacture are listed. E.S.

PACKAGING

ANON. The fractional package. Modern Packaging 23, no. 10: 91-5, 210 (June, 1950).

The trends in fractional packaging (the breakdown of a standard package into two or more units for preserving the freshness of unused units) are discussed, and examples of this type of packaging for crackers, bread, marshmallows and pretzels, cereals, powders, cheese, drugs, frozen-food units, etc., are given. 12 illustrations. E.S.

ANON. Hardware manufacturers reap dividends when they package for sales. Packaging Parade 18, no. 209: 48-9 (June, 1950).

Substantial sales increases in retail outlets have been reported as a result of the attention being given to hardware packaging. The examples given of unique package designs include red and white peppermint-striped tube containers for daylight control traverse rods, a roller-skate package featuring Hopalong Cassidy, and small polyethylene bags for such small items as washers and bolts, displayed on special cards or racks. These new packages will be on display at the National Hardware Show in New York in October, and special facilities will be available for foreign buyers. 8 illustrations. J.A.B.

ANON. Self-service department store. Fibre Containers 35, no. 6: 116-18 (June, 1950); *cf.* B.I.P.C. 20: 169.

The expanded self-service facilities in the new Evanston plant of Wieboldt Stores, Inc., are described, some of which are not on a complete self-service basis, since "customer service" is also available, depending upon whether the customers need or want help. There are still many unexplored fields in merchandise packaging in department stores; the lack of packaging for pots, pans, and kitchen utensils is particularly apparent, and many possibilities exist for the box manufacturer with vision. 3 illustrations. E.S.

U. S. OFFICE OF DOMESTIC COMMERCE. *Containers Section. General Products Division.* The retailer looks at packaging. Tappi 33, no. 6: 14A, 16A, 18A, 20A, 22A (June, 1950).

The text is reprinted from the Spring, 1950 issue of the *Industry Report, Containers and Packaging,* and contains the results of a nation-wide sampling of opinion at the retail level of the adequacies and shortcomings of present-day packaging. E.S.

PAPER—COATED (HOT-MELT)

BURGESS, L. M. Use of polyethylene as a paper coating. Paper Trade J. 130, no. 25: 31, 38 (June 22, 1950); Modern Packaging 23, no. 10: 140 (June, 1950); *cf.* B.I.P.C. 20: 650.

The suitability of polyethylene as a paper-coating agent and its properties are discussed. E.S.

PAPER—DEFECTS

BRUNO, MICHAEL H. Is it always the paper? Paper Mill News 73, no. 24: 113, 115, 124 (June 17, 1950); Paper Trade J. 130, no. 24: 98, 100, 102 (June 15, 1950); Paper Ind. 32, no. 4: 428-30 (July, 1950).

Following a brief description of the principles of the lithographic process

and of the common paper troubles (incorrect moisture content and pH, curling, linting, picking, splitting, etc.), some new problems are mentioned which are connected with the increasing use of coated papers in lithography. These troubles are slur, embossing, and mottling caused by poor moisture absorption; their causes and effects are analyzed. The harmful effect of an excessive amount of wetting agent in the coating is also mentioned. In addition, two problems on uncoated stocks are discussed: wandering spots which are believed to be connected with rosin spots in some way, and two types of offsetting—scuffing which occurs primarily on the rough-textured stocks of greeting cards, and an offset experienced in bookbinding when the folded and stitched signatures are subjected to smashing; in the latter case the ink transfers from the wire side of the paper. E.S.

KA.HE. Dusting of paper; prevent reclamations. Wochbl. Papierfabr. 78, no. 9: 247-8 (May 15, 1950). [In German]

The author discusses the factors which contribute to the dusting tendency of printing papers, such as defective pulpwood (decayed or compression wood), incorrectly ground or beaten pulps resulting in a free stock without mucilage, incorrect burring of pulpstones, incorrect dewatering and drying on the paper machine, soiled condition of rolls and felts, overheated drying cylinders, too rapid drying, and the quality of the fillers. Conditions will be improved by sizing when this is economically feasible. E.S.

PAPER—SHEET FORMATION

KANTROWITZ, M. S. Paper formation. Share Your Knowledge Rev. 31, no. 8: 18-19 (June, 1950). [Reprinted from New England Printer (May, 1950).]

The author defines the significance of closed, uniform, and wild formation and discusses the effects of poor formation on the printing results. E.S.

KASSING, B. L. Filtration and papermaking. Paper Mill News 73, no. 25: 9-10, 18 (June 24, 1950); Paper Trade J. 130, no. 24: 87-8 (June 15, 1950); Paper Ind. 32, no. 4: 430-3 (July, 1950).

The author discusses the factors affecting sheet formation (grain and two-sidedness) on the basis of a filtration analysis; additional influences, such as stock preparation and drying, are mentioned but not included. Directional differences originate at or very near the slice and can be minimized if the stock velocity is held as close as possible to the wire speed. It is extremely difficult to cause paper fibers to contact the cylinder with the same velocity as the cylinder; this accounts for the fact that grain differences are more pronounced in cylinder than in Fourdrinier sheets. The shake has no particular effect on the arrangement of the individual fibers. The structural difference of wire and felt side (two-sidedness) is caused by the condition of the stock and the conditions of filtration on the wire, i.e., by the fact that the two sides are composed of elements of different dimensions in different structural arrangement. The result is a sheet which curls with humidity changes because its expansion-contraction characteristics are different on the two sides. The papermaker may succeed in minimizing this undesirable structural difference, but he can never totally eliminate or overcome it. E.S.

PAPER AND PULP INDUSTRY

ANON. Paper industry in India; facts at a glance. Paper Trade J. 130, no. 24: 134-5 (June 15, 1950).

Historical and statistical data of the Indian pulp and paper industry are given. E.S.

ANON. Pulpwood, pulp and paperboard industries in Canada. Fibre Containers 35, no. 6: 38, 43-4, 46 (June, 1950); *cf.* B.I.P.C. 20: 412-13.

Statistical data on the Canadian pulp, paperboard, and paperboard box industries (pulpwood, wood pulp, paperboard, and costs of box raw materials) for recent years (in some cases including the first six months of 1949) are presented. The data were assembled from the yearly statistics of the Dominion Bureau of Statistics and a report of the United States Embassy in Ottawa, Canada. 9 tables. E.S.

DEACON, PAUL. Newfoundland developments. Newsprint Service Bur. Bull. no. 389: 2-3 (June, 1950).

The Newfoundland pulp and paper industry is leading all others in the value of goods produced; newsprint (40,000 tons per month) is the most important item, and virtually all newsprint is for export, mostly to the United States. The financial position of the two newsprint mills, Anglo-Newfoundland Development Co. and Bowater's Newfoundland Pulp and Paper Mills, during recent years is discussed, and the possibilities for a third development on the island at Baie d'Espoir with year-round navigation facilities are mentioned; its pulpwood supply would come from Labrador. The possible expansion of the operations of the present companies requires careful study based on the available pulpwood supply. E.S.

EVEREST, D. C. Pessimistic outlook not justified by industry's prospects. Pulp Paper Mag. Can. 51, no. 6: 70-4 (May, 1950).

The author emphasizes the favorable position of the North American pulp and paper industry, with particular reference to the fact that there is no economic substitute for paper. E.S.

FOWLER, R. M. Developments in the Canadian pulp and paper industry. Can. Pulp Paper Ind. 3, no. 6: 6-10, 34 (June, 1950).

The important part is emphasized which the Canadian pulp and paper industry plays in the economy of the country, and reference is made to the improvement in Canada's world position as a producer of pulp and paper products as a result of the change in the general distribution of pulp production and consumption in the last decade. Data on the newsprint industry are given, and the somewhat tiresome, recurrent attacks against it in Washington are discussed briefly. In conclusion, another important development within the industry is mentioned, i.e., the efforts of its leaders to find ways of reconciling the somewhat conflicting interests of labor, customers, shareholders, and society at large. The recent record shows that the process of recognizing these interests is well advanced, although it might be argued from the point of view of the shareholders that it has gone too far. 1 map and 3 graphs. E.S.

KOTTE, HANS. A trip through Sweden; impressions from the most recent developments in the pulp and paper industry. Allg. Papier-Rundschau no. 4: 157-60; no. 5: 204-7; no. 6: 285-8; no. 7: 333-6; no. 9: 461-4; no. 10: 512-16 (Feb. 28, March 15, 30, April 15, May 15, 30, 1950). [In German]

The author gives an illustrated account of his recent trip to Sweden (late fall of 1949), during which he visited the new research institute in Stockholm and a number of prominent pulp and paper mills and their research laboratories. Frequent reference is made to new developments in machinery. 1 table and 47 illustrations. E.S.

TYABJI, F. S. Note on paper industry in Ceylon. Indian Pulp and Paper 4, no. 9: 377 (March, 1950).

In an attempt to stabilize the economy by industrialization, the Ceylonese government established a small-scale paper factory in 1935 and found it so successful that plans were made for a larger postwar factory. This is to be located on the east coast in Valaichcheni and will use as raw materials illuk grass and rice straw. The recommended capacity is 3000-4000 tons at first, and later 7500 tons per year. Production is expected to begin in 1951-52. J.A.B.

U. S. FEDERAL TRADE COMMISSION. Trade practice rules for the fine and wrapping paper distributing industry. Paper Trade J. 130, no. 23: 13-14, 16 (June 8, 1950); Paper Sales 10, no. 6: 14, 33-6 (June, 1950).

The text of the rules in Group I and II is given, which the Commission promulgated to foster and promote the maintenance of fair competitive conditions in the interest of protecting industry, trade, and the public; they will become effective June 15, 1950. E.S.

PAPER AND PULP INDUSTRY—EDUCATION

CHÊNE, M. Instruction given at the French school of papermaking. Papeterie 72, no. 5: 226-7, 229, 231, 233 (May, 1950). [In French] *cf.* B.I.P.C. 19: 176.

Following a brief outline of the courses given at Grenoble, the author describes the steps taken by which the school of papermaking was recently given the rank of "Ecole Nationale Supérieure d'Ingénieurs," thus giving greater prestige to the diplomas of future engineering graduates. The courses were extended from three to four years; the school retains its name. The problems of outlining courses for men who will function as machine tenders and in similar capacities are also discussed. L.E.W.

PAPER AND PULP MILLS

ANON. Crossett completes expansion; new building, equipment. Paper Mill News 73, no. 22: 12-13 (June 3, 1950); *cf.* B.I.P.C. 19: 492.

Most of the expansion program of Crossett Paper Mills, Crossett, Ark., will be completed during 1950; the new Beloit Fourdrinier machine started operation on January 17, 1950. A brief description of the "Pioneer" is given, which is designed to make papers in the range of 20-40 pounds basis weight. 4 illustrations. E.S.

ANON. Pulp and paper mills in Canada. Pulp Paper Mag. Can. 51, no. 6: 80, 98 (May, 1950).

A revised list of Canadian pulp and paper mills in order from West to East is presented; a total of 130 mills is listed. E.S.

PAPER CONDITIONING

KING, CHARLES F. Problems of conditioning paper. Inland Printer 125, no. 2: 41-4 (May, 1950); polemic: no. 4: 43-4 (July, 1950).

The author emphasizes the fact that the problem of the behavior of paper in air-conditioned pressrooms is only partially solved. All the work done by the National Bureau of Standards under the sponsorship of the National Lithographic Foundation has for its fundamental premise the idea that the moisture content of paper and, hence, its dimensional stability depend upon the relative humidity of the atmosphere to which it is exposed. The author presents evidence (actual pressroom experience and own studies carried out about 15 years ago) that temperature and absolute humidity may play an equally or even more decisive role, and that neither the moisture content of the paper nor the dimensional stability was a function of the relative humidity over the range of dry-bulb temperatures encountered during the test period in the author's studies. A research project is suggested in which the other variables are investigated without the assumption that the relative humidity is the governing factor; simpler air-conditioning equipment and improved hygrometers might result from such a study, as well as the discovery that much of the expensive seasoning given to some offset stocks is unnecessary when the correct variables are brought under control. E.S.

RUSSELL, H. RADFORD. Pre-conditioned paper. Pulp & Paper 24, no. 7: 99-100 (June, 1950); Paper Mill News 73, no. 22: 11, 14 (June 3, 1950).

The cycle conditioner is described which was developed by the Everett Pulp & Paper Co. in co-operation with the J. O. Ross Engineering Corp. It consists of a cold chamber and a conditioning chamber with recirculated, high-humidity, warm air; the web makes four passes through both units (from the cool to the warm chamber) and leaves the conditioner by way of the cool chamber before being wound in a roll. The paper is usually shipped with 5.5% moisture. 1 diagram. E.S.

PAPER MACHINE OPERATION

GENERAL ELECTRIC COMPANY. *Special Products Division.* Paper tensiometer. Gen. Elec. Rev. 53, no. 5: 48 (May, 1950); Paper Trade J. 130, no. 18: 48 (May 4, 1950).

Brief reference is made to a new paper tensiometer which keeps a continuous check on the tension of paper during manufacturing and reeling operations. It consists of a small steel roller, riding on top of the moving paper; changes in tension shift its position slightly. The roller is fixed to the end of an arm which bends as the roller rises or falls. The bending of the arm is measured by a strain gage which is connected to the electronic controls of the paper machinery. E.S.

PAPER SPECIALTIES

ANON. Can that needs no opener. Modern Packaging 23, no. 10: 115 (June, 1950).

General Mills introduced a new package, "Flex-Can," for marketing soup mixes. The package has the appearance and rigidity of a paperboard container, although no box structure is involved. It is made from a lamination of aluminum foil forming the inner and outer surfaces, with a middle ply of heavily waxed paper. The materials are fed into the machine from rolls, and the container is formed, filled, and sealed automatically. Wax and spe-

cial adhesives give strength to the end seals. Unusual moisture and flavor protection is claimed for the package. 1 illustration. E.S.

ANON. New paper uses; tympan and frisket paper. Paper Trade J. 130, no. 21: 18 (May 25, 1950).

Different applications of Spherekote tympan and frisket paper (glass-beaded sheets made by Minnesota Mining and Manufacturing Co.), in addition to their regular use, are mentioned, including idler roll wrappings, as finishing paper for softwoods and burnishing paper for leather and metals, and as insulation for lower frequencies and voltages, although its efficiency as an insulator drops off markedly at higher humidities. 2 illustrations. E.S.

ANON. Printing without ink. Rohm & Haas Reptr. 8, no. 2: 4-6 (April-May, 1950).

Brief reference is made to difficulties experienced in the preparation of Braille paper matrices, when the manila paper used for the master copy is hardened with a plaster preparation. Uformite CB-553 (urea-formaldehyde resin) was applied in place of the plaster and found far more satisfactory. Uformite-treated matrices can be used repeatedly, in marked contrast to the old matrices which could seldom withstand more than one application to the press roll. 3 illustrations. E.S.

MID-STATES GUMMED PAPER COMPANY, *Chicago.* New strapping tape. Fibre Containers 35, no. 6: 94-5 (June, 1950).

Brief reference is made to a new strong gummed paper-tape strap which can be substituted for steel strapping on many types of containers. Two layers of kraft paper are bonded into a sandwich, with reinforcing fibers between them; these fibers run the long way of the tape strap. The tensile strength is 180 pounds for each inch of width; the tape glues fast to the container and cannot be removed and replaced. Either the tape or the container must be cut to reach the contents, so that pilferage is instantly detectable. The tape handles as easily as ordinary gummed tape and is applied in the same way; no pressure is required. Examples of applications illustrate great savings in time in the shipping room. 2 illustrations. E.S.

RESS, HANS. Electrical properties of paper. Das Papier 4, no. 5/6: 73-7; no. 7/8: 113-18; no. 9/10: 149-55 (March-May, 1950). [In German]

The author describes the uses of paper in electrical engineering, the physical and chemical properties demanded of insulating papers, the raw materials used in their production, impregnation techniques, and the properties of such impregnating agents. The electrical requirements of paper (dielectric constant, dielectric strength, and insulation resistance) are fully discussed. Reference is also made to dielectric losses, and to factors independent of the materials used (e.g., frequency, temperature, voltage, time, and ambient conditions) and to such factors as moisture sorption, technique of impregnation, and effects of calendering, which have a bearing on electrical properties. 4 tables and 78 references. L.E.W.

PATENTS

WEST, CLARENCE J. United States patents on papermaking; fourth quarter, 1949. Tappi 33, no. 6: 85-90A (June, 1950); *cf.* B.I.P.C. 20: 731.

A list of U. S. patents on papermaking for the fourth quarter of 1949 is presented. E.S.

PENSIONS, INDUSTRIAL

CASEY, WILLIAM J. Pension plans—your problems. Paper Ind. 32, no. 3: 274-5 (June, 1950).

The author discusses the problems involved in setting up and financing pension plans in industry. E.S.

PHYSICAL TESTING—PAPER

FEHRLIN, A. The Eidg. Materialprüfungs- und Versuchsanstalt (Swiss Materials Testing and Experimental Station, EMPA) in the year 1949; Main Division C, St. Gallen. Textil-Rundschau 5, no. 4: 154-5 (April, 1950). [In German]

The activities of the textile division of EMPA during 1949 are reviewed, including the testing program of the paper division. E.S.

MACK, HEINZ. Testing methods for paper and board. Allg. Papier-Rundschau no. 8: 384-7 (April 30, 1950). [In German]

Different testing instruments used in the paper industry are described briefly, including testers for measuring tensile strength, bursting strength, elongation, folding endurance, impact tear resistance, tear-through resistance, stiffness, bending strength, smoothness, porosity, circular tensile strength, absorptivity, and dimensional stability; in conclusion, the microscope is listed as an indispensable instrument. 5 illustrations and 1 reference. E.S.

PHYSICAL TESTING—PAPER—BURSTING STRENGTH

QUINN, DON L. A defense of the Mullen or Cady bursting test. Shears 68, no. 690: 38 (June, 1950).

The author emphasizes the value of the Mullen or Cady bursting test for dividing fiberboard shipping containers into groups such as 175, 200, and 275-pounds test; however, it is not a good criterion of fabricating practices and should not be used for this purpose. This defense of the bursting test is a defense in principle, because it is recognized that the operation of the machine and the technique for making the tests may involve great weaknesses. Various regulations, such as Rule 41, should be revised to define the requirements for insuring correct test results. E.S.

PHYSICAL TESTING—PAPER—GLOSS

HAMMOND, HARRY K., III, and NIMEROFF, ISADORE. Measurement of sixty-degree specular gloss. J. Research Natl. Bur. Standards 44, no. 6: 585-98 (June, 1950).

Specular gloss is the attribute next to color that is most often used in the evaluation of the appearance of objects. For 10 years the American Society for Testing Materials has used a method of testing for the 60° specular gloss of paint finishes which is based on research done at this Bureau. The ASTM method prescribes the illuminator and receiver apertures that are to be used. However, in order to determine the uncertainties involved in the calibration of gloss standards, the rate of change of gloss reading with change of aperture was investigated throughout the gloss scale. This was done by modifying an existing goniophotometer so that it became in effect a

versatile glossmeter with provision for accurately controlling all of the known geometrical variables involved. Data obtained on the variation of gloss reading with aperture show that standards with widely different distributions of reflected light can be used to check the adjustment of glossmeters and the conformance of their apertures to ASTM specifications in the increasingly important medium- to high-gloss range. The problem of obtaining the diffuse correction, which involves source polarization and departure of the specimen from a perfect diffuser, has been investigated. 1 table, 15 figures, and 11 references. E.S.

PHYSICAL TESTING—PAPER—MICROSCOPIC

VAN KUYEREN, N. A rapid method for making cross sections of paper and films. Papierwereld 3, no. 24: 501-3 (July 1, 1949); V.I.-Pamphlet no. 16: 8 p. (1949); Tech. Bull. Brit. Paper and Board Makers' Assoc. 26, no. 7-9: 50 (July-September, 1949). [Originals in Dutch; abstract in English]

It has been found that cross sections of paper and film can be cut satisfactorily with the Hardy hand microtome, originally designed for the cutting of textile fibers. Strips of paper, 4.5 mm. wide, are placed in the slot of the instrument and the space left vacant is filled with fibrous material (coarse wool, mercerized cotton, artificial embroidery silk, etc.). The purpose of this packing is to hold the specimen firmly in place. Surplus material and paper are cut off, and the surface is coated with nitrocellulose lacquer, which is allowed to dry hard for 20 minutes. The section is then prepared by a cutting (never a sawing) action of the blade and placed, cut surface upwards, on a microscope slide, and mounted in dilute Canada balsam or other suitable medium. The paper can be stained either before or after sectioning with reagents; films are treated in exactly the same manner. Four photomicrographs are included, showing a casein-coated paper stained with Ponceau RR, paper containing melamine resin in the body of the sheet and on the surface (Solway blue BNS), and a viscose film coated with polyvinyl chloride viewed in polarized light (Neocarmine or Shirlastain). Directions for the correct use of the Hardy microtome are given; after some practice, a complete section can be prepared in 10 minutes. 7 figures. E.S.

PHYSICAL TESTING—PAPER—OPACITY

HARRISON, V. G. W., and POULTER, S. R. C. The measurement of opacity and reflectivity for printing papers. Paper Market: 109-13 (April, 1950); Paper-Maker (London) 119, no. 6: 416-18, 420, 429 (June, 1950).

A new opacimeter, manufactured by Hilger and Watts Ltd. in accordance with recommendations put forward by Harrison (*cf.* B.I.P.C. 10: 391), is described. The visual rankings of opacity of 19 papers are compared with the results obtained with the new opacimeter and with the Bausch and Lomb opacimeter. Each instrument correlates perfectly with the visual rankings, the rank correlation coefficient being +1.0000. 3 tables, 1 figure, and 3 references. J.A.V.

PHYSICAL TESTING—PAPER—PRINTABILITY

GUSTAFSSON, G. RURIK. A review of the literature on the influence of paper upon the printed result. Paper and Timber (Finland) 32, no. 4: 104-7 (April, 1950). [In Swedish]

The author reviews the important publications on the printability of paper and the influential factors. 60 references. E.S.

PHYSICAL TESTING—PAPER—TENSILE STRENGTH

VERBAND SCHWEIZERISCHER PAPIER- UND PAPIERSTOFF-FABRIKANTEN. *Technische Kommission.* Determination of the tensile strength and elongation of paper. Textil-Rundschau 5, no. 3: 101-4 (March, 1950). [In German]

The text of the Swiss tentative standard VSPPF-EMPA C 1061 is given, which covers a simple tear test for determining the tensile strength and elongation of paper. (A second procedure, C 1062, involves a tear test through the determination of the visco-elastic behavior of the paper samples; this is not included.) Definitions of the terms employed are given; sample taking and conditioning, the testing equipment and procedures, and the evaluation of the results are outlined. 2 diagrams. E.S.

PHYSICAL TESTING—PAPER—VAPOR TRANSMISSION

NOLL, AUGUST. Testing the water and water-vapor permeability and greaseproofness of smooth and folded papers. Wochbl. Papierfabr. 78, no. 9: 244-6 (May 15, 1950). [In German]

Thus far, the testing and evaluation of different wrapping papers and cellophane for water and water-vapor permeability and greaseproofness has been carried out with smooth specimens exclusively. However, since practical use requirements in wrapping involve not only smooth but also folded and bent sections, these testing procedures do not give the complete results. The author proposes that all samples be also tested in folded condition, involving three crosswise folds so that the specimen (after unfolding and smoothing with the fingers) is divided into 16 fields. Data on the properties of smooth and folded papers (a simple cross fold resulting in four fields [I] and three cross folds [II]) are given in tabular form; they show a considerable decrease in the resistance of the different samples after (I), and a still more pronounced decrease after (II) in all cases, even if the smooth papers were practically water-, water-vapor-, or greaseproof. 3 diagrams and 3 tables. E.S.

PHYSICAL TESTING—PULP—SCREEN ANALYSIS

REED, ARTHUR E., and CLARK, JAMES D'A. An instrument for rapid fractionation of pulp. Tappi 33, no. 6: 294-8 (June, 1950).

The new four-screen classifier developed by Clark is described and its operating procedure given. This instrument divides a five-gram sample of pulp into four fractions plus debris, in four minutes. Reference is made to the method of calculating the weighted average fiber length by weight of a pulp sample from classifier data. This method was published earlier (*cf.* B.I.P.C. 19: 183) and is not repeated in detail. The operating conditions and the weighted average fiber length of the fibers in each fraction were determined experimentally, using Clark's projection method (*cf.* B.I.P.C. 13: 142). These fiber lengths were as follows: on 14, 3.85 mm.; 14/28, 2.70 mm.; 28/48, 1.70 mm.; 48/100, 0.95 mm.; through 100, assumed 0.10 mm. The distribution of fiber lengths was plotted to verify the above method. It was found that in this classifier the weighted average fiber length by weight in each fraction was 8% greater than the arithmetical average fiber length. Mill data are presented to demonstrate the usefulness of this instrument and method in pulp refining studies. 3 tables, 3 diagrams, and 5 references. E.S.

PHYSICAL TESTING—PULP—STRENGTH

GEOHEGAN, K. P. Pulp testing. Tappi 33, no. 6: 66A, 68A, 70A; discussion: 70A, 72A (June, 1950); *cf.* B.I.P.C. 19: 865.

The author reasons along lines similar to those in the previous reference and includes some of the statements by James d'A. Clark (*cf.* B.I.P.C. 20: 806). E.S.

PINE

MURTO, JAAKKO, and ITKONEN, JUSSI. Southern pine and its use as raw material in the sulfate process. Paper and Timber (Finland) 32, no. 4: 108-23 (April, 1950). [In Finnish; English summary]

The author gives a detailed description of the pines grown in the southern United States, with particular reference to their suitability for the sulfate process. A comparison is made between the anatomical features of southern and Finnish pines and the technological properties of their kraft pulps. 6 tables, 13 figures, and 88 references. E.S.

PITCH TROUBLES

GAVELIN, GUNNAR. Pitch troubles in paper mills. Svensk Papperstidn. 53, no. 7: 179-82 (April 15, 1950). [In Swedish; English summary]

Analytical methods for pitch control in paper mills are discussed. The values obtained by solvent extraction of pitch from pulps do not indicate the stickiness of the pitch or the amount of free sticky (harmful) pitch present in a pulp. Nevertheless, such extractions from pulp and white water may be of use in laboratory control. To estimate how a certain pulp will run in a paper mill, the harmful pitch must be determined by different procedures, three of which are described briefly. The determination of wet strength (*cf.* B.I.P.C. 20: 194-5) may also prove useful in studying the pitch problem. Too little is known about the factors influencing pitch troubles, particularly in wood storing and cooking. A few problems worth studying along these lines are listed. Several methods for lowering the pitch content are described, such as the removal of the pitchy ray cells, the use of fillers, treatment of the process water, and the addition of hexametaphosphate or alum. The effect of acid in pitch troubles is also discussed. The article is essentially a review. 3 tables and 3 references. E.S.

PLASTICS

TO. Ferrozell, a versatile construction material. Wochbl. Papierfabr. 78, no. 8: 216 (April 30, 1950). [In Germany]

Reference is made to the properties and possible applications of Ferrozell, a laminated textile-phenol-formaldehyde plastic material (cogwheels, pipes, tools, wheels, etc.). E.S.

WEISS, JOHN M. Plastics and organic chemicals. Chem. Eng. News 28, no. 19: 1554-6 (May 8, 1950).

The author analyzes the trends of the different types of plastics, apart from fiber possibilities; the consumption of cellulose-base plastics, with the exception of a slight peak in 1946, has not grown considerably during recent years, whereas all other plastics have increased from 213 million pounds in 1939 to 1470 million pounds in 1949. Data on phenolics, alkyds, urea and

melamine, vinyl, styrene, polyethylene, and acrylates are given. It appears that synthetic plastics taken as a whole have by no means reached their peak, and the total tonnage may be expected to increase at a rapid rate. The rise may be interrupted by business recessions, but the upward trend will certainly greatly exceed ordinary cyclical growth. A serious problem in the development will be the raw material supply and especially the capital investment necessary to make such raw materials available. 2 tables and 2 diagrams. E.S.

PLASTICS—TESTING

SIMRIL, V. L., and HERSHBERGER, A. Permeability of polymeric films to organic vapors. Modern Plastics 27, no. 10: 97-8, 100, 102, 150-2, 154, 156, 158 (June, 1950).

The permeabilities of 16 polymeric films (including cellulosic and non-cellulosic specimens) to organic vapors are reported in terms of the permeability constant P. The effects on permeation rates of film and vapor structure and properties are discussed and related to the general theory of permeation advanced previously by other workers. It is shown that the least permeable polymers are those whose molecular structure is such as to permit close packing and strong intermolecular bonding and whose adsorption or solution of vapor is low. The presence of bulky side chains and the introduction of plasticizers increase permeability in general. The chemical and electrical similarity of polymer and vapor increases the solubility and, therefore, permeability. The effects of temperature and film thickness are also discussed in the light of polymer and vapor characteristics. The data presented here strongly suggest the possibility of tailor-making films to afford any degree of permeability to any organic vapor. 10 tables and 7 references. E.S.

POWER

JAROSCHEK, K. Heat-economy problems of our times. Wochbl. Papierfabr. 78, no. 8: 213-14 (April 30, 1950). [In German]

The author reviews the possibilities for reduced coal consumption in Germany through increased efficiency in steam and power generation. The gas turbine is not suitable at present for German power-plant applications, because liquid fuels are too expensive. E.S.

PLAISTED, G. E. Power at East Antioch. Pulp & Paper 24, no. 7: 64, 66, 68 (June, 1950).

Steam and electric power installations at the new board mill near Antioch, Calif., are described. Three extraction-type turbines take steam at high pressure and drive 5000 kv.-amp. electric generators, while at the same time steam at low pressure is bled from them for process use. The chipper with its severe shock loads is driven by a separate steam turbine. Power is generated at 4160 volts and distributed to eight unit substations, at which it may be transformed to 440 volts for short feeder distribution. Details of the Amplidyne-controlled, sectional drives of the board machines and of the various drives of the auxiliary machinery are given. 8 illustrations. E.S.

PRINTING AND PRINTER'S INK

ANON. Progress in offset prevention. Fibre Containers 35, no. 6: 112-14 (June, 1950).

Following a brief outline of fundamental offset problems and the prin-

ciples of usual spray systems, reference is made to the D-Y Dry Spray process developed by the Dunaway-Yahnke Co. of Philadelphia for the printing of folding cartons, many of which are used for food products requiring nontoxic ingredients. The spray system is self cleaning with a valve-controlled flow of powder; the powder itself is highly soluble in the ink, edible, nonabrasive, and nonclumping, resulting in perfectly smooth, glossy, or varnished sheets. Press loads as high as 1950 sheets can be run without danger of offset. 2 illustrations. E.S.

ARO, EINO. Litho and printing papers from the printer's point of view. Paper and Timber (Finland) 32, no. 4: 101-2 (April, 1950). [In Finnish]

The author briefly discusses the demands which the printer places upon satisfactory paper. E.S.

TIME, Inc. Balanced ink. Chem. Inds. 66, no. 6: 824 (June, 1950).

One obstacle to greater printing speeds has been the time required for ink to set. The development of heat-set inks permitted higher speeds, but brought forth a new problem, in that the near-scorch temperatures caused the paper to become brittle and lose most of its strength. An ink which will set rapidly without heat has now been developed; the basic principle involves the upsetting of the equilibrium in a three-component system of a resin and two solvents, one of which is an alcohol. The resin is insoluble in either solvent alone, but is completely soluble in a given combination of the two. If the solvent balance is upset, the resin immediately precipitates. When the new ink hits the paper, a sufficient quantity of one solvent is almost instantaneously removed through a combination of evaporation and absorption, which causes the ink to set. Best results are obtained with 15-20% of scorch heat, which is not sufficient to affect the paper. The ink ultimately dries to a hard glossy film with good tone. The new ink is still in the patent-application stage, so that full details are not yet available. E.S.

VOET, ANDRIES. Dynamics of film separation in the printing process. Am. Ink Maker 28, no. 6: 36, 57 (June, 1950).

The response of any liquid to a stress may be resolved into viscous and elastic components. At press speeds ink and paper are forced to respond to rapid and sudden changes in stress, and under these conditions of high rates of deformation the elastic reactions completely overshadow the viscous reactions. Film separation thus occurs by rupture in a solid pattern, and this rupture occurs when the energy absorbed by the film from the shock wave exceeds a critical value, the rupture energy. Since the shock wave originates at the point of impact between the paper and ink, propagation of the wave occurs in both the ink and paper. Thus rupture may occur in the paper when the rupture energy of the ink exceeds that of the paper. A simple and accurate method for the determination of the energy of film separation has been developed. 6 references. J.O.T.

VUORIO, V. A. Printing equipment and printing processes. Paper and Timber (Finland) 32, no. 4: 96-100 (April, 1950). [In Finnish]

The various printing processes are outlined. 6 diagrams and 7 references. E.S.

WEYMOUTH, F. A. Limitations of ink adjustments to paper. Paper Trade J. 130, no. 24: 118, 120-1 (June 15, 1950); Paper Ind. 32, no. 4: 426-7 (July, 1950).

The author reviews the methods by which a good printing job is accomplished. It is felt that more press troubles would be eliminated if limitations of the adjustments of inks to papers were better known by the individual who chooses the paper for the job. Ink adjustments that can be made with certain categories of papers are discussed. It is pointed out that new tools are available in the form of tack-graded inks which should lend assistance in the choice of papers for jobs. Not all papers are covered, but examples are given and the suggestion made that these ideas can be carried out in other categories of paper. Comments on printability testing are given. It is reported that an increasing number of paper mills and printers are using these methods and are finding them to be of assistance in paper control. 3 tables and 3 references. E.S.

WIKLUND, L. G. The printing properties of paper. Paper and Timber (Finland) 32, no. 4: 102-4 (April, 1950). [In Swedish; English summary]

The author describes the influence of the papermaking procedures upon the behavior of the paper during the printing process, with particular reference to the defects of two-sidedness, waving and curling, dusting, and picking. The finished paper is a compromise between frequently conflicting demands, such as good absorptivity and high strength, light weight and opacity, etc. To produce a suitable printing paper for a given purpose, co-operation between the printer and papermaker is essential; the papermaker should be informed about the use requirements of his paper and the printing process to be employed. E.S.

RADIOACTIVITY

SCHREIBER, A. P. The use of radioisotopes for process control in pulp and paper manufacturing. Tappi 33, no. 6: 28A, 30A, 32A, 34A (June, 1950).

Following a brief outline of the production of radioisotopes, representative examples of their application in industry are given, with particular reference to their possibilities in the pulp and paper industry. One of the most promising uses of immediate application is in gaging and physical measurement problems. The principles of a beta-ray absorption gage for the continuous, noncontacting measurement of the basis weight of paper or board are outlined. An even newer development, a gage utilizing the principle of beta-radiation backscattering can be used for measuring continuously extremely thin condenser and cigarette paper or for gaging coatings, such as barium sulfate on photographic paper. The use of radioisotopes as tracers for following constituents through a series of chemical reactions or to carry out flow studies are discussed, and examples of tracer techniques for pollution problems and material balance studies are outlined. The pulp and paper industry will also receive indirect benefits of the results of research work done with the aid of radioactive tracers by metallurgists, petroleum chemists, and others. Examples are given of the contributions of radioisotopes toward furthering the basic knowledge of metallurgy, the mechanism of friction, and lubrication. Although it is not anticipated that radioisotopes will cause immediate, widespread radical changes in industry, they have already proved of great value as a versatile tool in many projects which heretofore were either very difficult or actually impossible to carry out with conventional methods. 3 figures and 5 references. E.S.

RAYON—STATISTICS

MURDOCK, HAROLD R. Can Japan restore its pre-war rayon markets? Rayon and Synthetic Textiles 31, no. 6: 33-6 (June, 1950).

Japan's rayon production figures before and after the war are compared, and it is pointed out that although Japan ranked first in the world in 1937, only 67 million pounds of filament and 60 million pounds of staple fiber were produced in 1949. Production is far below normal home consumption, and the only hope for extensive exports is increased production. The factors preventing an increased output are: insufficient raw materials, inadequate equipment, unstable labor conditions, and lack of technical knowledge. The forests of Japan are being depleted by over 150% of the annual growth increment, and she is without export funds in dollars and sterling to purchase dissolving pulp, cotton linters, and other materials externally. The production figures of the different countries by year, the operating capacities and production of the various Japanese plants, and their production schedules for 1950 are included in 6 accompanying tables. J.A.B.

RAYON—VISCOSE PROCESS

RINGSTRÖM, E., and APLER, N. H. Swelling and floating tendency of pulp sheets at steeping in the viscose process. II. Svensk Papperstidn. 53, no. 5: 127-32 (March 15, 1950). [In English; German and Swedish summaries] *cf.* B.I.P.C. 19: 345.

In the first part of this article it has been shown that swelling and the floating tendency of pulp sheets during steeping in the caustic soda solution depend upon the rate of filling; a laboratory method has been developed for studying these phenomena. Using the identical method, the authors investigated in the present study the influence of the properties of the steeping liquor, notably concentration, temperature, hemicellulose content, and surface tension. The present results indicate that a concentration should be determined which will give the maximum yield of viscose at the optimum filling rate (also from the swelling and floating-tendency viewpoints). The effect of the three other variables is principally a decrease in the rate of liquor absorption (or capillary rise), which causes a decrease in the optimum filling rate. Several secondary influences are also discussed, such as the greater swelling of the pulp at lower temperatures, and the higher floating tendencies in the presence of increasing quantities of either cation or anion surface-active agents in the steeping liquor. The rate of liquor absorption was found to be of utmost significance, and all factors which exert an influence upon it must receive consideration. This holds not only for the liquor and general steeping conditions, but also for the pulp, as will be shown in a future paper. 1 table, 6 figures, and 4 references. E.S.

RESEARCH LABORATORIES

GRISWOLD, WADE. Trends in the lithography industry. Am. Paper Merchant 47, no. 6: 24, 31 (June, 1950).

The author explains the purpose of the Lithographic Technical Foundation and mentions some of its valuable services. A list is given of the important trends in the industry, such as specialization, combination plants, decentralization, smaller presses, more multicolor units, greater demand for narrow tolerances on uniformity, and increased use of coated papers. J.A.B.

SALESMEN AND SALESMANSHIP

BORDEN, RICHARD C. 12 self-assignments to selling success. Pulp Paper Mag. Can. 51, no. 6: 75-8 (May, 1950).

Useful suggestions for successful selling are given. E.S.

PAPER SALES. Prepackaging—the "new look" in food merchandising. Paper Sales 10, no. 6: 15-17, 20, 36-8 (June, 1950).

The paper salesman plays a leading role in prepackaging, for it is through him that the commercial consumer obtains the information needed for successful prepackaging operations. In a series of questions and answers concerning the prepackaging of meats, transparent films and backing materials, expected shelf life, methods of sealing and labeling, and sales opportunities are discussed. A similar article on the prepackaging of produce will follow. 4 illustrations. J.A.B.

YOWELL, L. Q. Carpenter's postwar sampling unit. Am. Paper Merchant 47, no. 6: 20-1 (June, 1950).

The desk-model fine paper sampling unit distributed by the Carpenter Paper Company to its customers consists of a walnut cabinet measuring 12½ by 9 by 7 inches and containing seven looseleaf notebooks with a representative color, weight, and finish for each item stocked by the company. The contents of each book are identified by a label on the spine. A similar set of sample books is incorporated in a special rigid carrying case for salesmen. 4 illustrations. J.A.B.

SALT WATER

FIRESTONE, JOHN T. Salinity of salt water-borne wood. Tappi 33, no. 6: 260-2 (June, 1950); Pulp & Paper 24, no. 8: 76, 91 (July, 1950); Pulp & Paper 24, no. 8: 76, 91 (July, 1950).

In a closed sulfite process the accumulation of inorganic salts may present an operating problem. Logs transported in salt water pick up a considerable quantity of salt. The object of this investigation was to determine the amount of inorganic salt introduced into the pulping system at the Everett pulp mill of the Weyerhaeuser Timber Co. Approximately 73% of the chips used were produced from salt water-borne logs. It was found that for each ton of airdry chips charged to the digester, 5.1 pounds of salt were introduced to the pulping process. This is an average value, and large variations in salt content occur in the wood supply. 4 tables and 3 references. E.S.

SEMI-CHEMICAL PULPING PROCESS

MURTFELDT, L. W. Production of neutral semichemical sulphite for high grade book paper. Paper Trade J. 130, no. 26: 27-9 (June 29, 1950).

The author describes a 75-ton daily-capacity plant for making bleached neutral semichemical sulfite poplar pulp at Wisconsin Rapids, Wis., including liquor plant, digesters, refiners, and bleaching operations. At present as an expedient, a blend of neutral semichemical and acid sulfite is bleached by a three-stage process with satisfactory results. Although the blended pulps are dissimilar in chlorine demand, each seems to utilize the required chlorine without undue under- or overbleaching under the special conditions employed; the process is not recommended under different conditions, where results may be quite unsatisfactory. The unbleached semichemical poplar

pulp is characterized by high Mullen, high tensile, and medium-to-low tear as compared with spruce or balsam sulfite. A high hemicellulose content causes rapid hydration when beaten. For many purposes the pulp can be considered prehydrated with many of the characteristics of sulfite at the same degree of development. The unbleached and single-stage oxidation bleached fibers are quite straight and form a stiffer sheet than sulfite. The fully bleached pulp is much higher in Mullen, tear, and tensile, and the fibers are more flexible. 1 table and 1 flowsheet. E.S.

SAPP, J. E. The production and refining of semichemical pulp for corrugating board. Paper Trade J. 130, no. 26: 22-4 (June 29, 1950).

The author describes the manufacture of semichemical pulp for corrugating board, based on data obtained in actual mill operation and mill-scale experiments during the past several years in plants of the Gaylord Container Corp. Pulping, liquor recovery, and refining are covered. The sulfate semichemical process was found preferable for some species, such as oaks, and the neutral sulfite process for others, such as the gums. The used cooking liquors from either process can be recovered, mixed with regular sulfate black liquor, evaporated, and burned without any appreciable difficulties. Refining plays a very important part in the process. Disk refiners are commonly used; a smooth, even feed at high consistency is particularly important to obtain maximum performance. 4 tables and 1 reference. E.S.

SCHWARTZ, SIDNEY L., and BAIRD, P. K. Effect of fibre-size distribution on the properties of hardboards made from fiberized water-soaked Douglas-fir. Paper Trade J. 130, no. 24: 106, 108, 110, 112, 114, 116, 118 (June 15, 1950).

Pulp stocks produced by processing water-soaked Douglas-fir chips in an attrition mill consisted of fiber bundles, bruised individual and cut fibers, and disintegrated fibers or fines. As the power input in milling was increased, the amount of fiber bundles decreased and, in general, the fines and the drainage time of the stocks increased. The strongest hardboard produced from these stocks had a modulus of rupture of 6500 p.s.i. at a specific gravity of 1.0, but the stock from which it was prepared drained too slowly for commercial application. The production of acceptable-quality hardboard stocks without the use of resins or other additives was resolved into either of two procedures: (1) preparation of stocks at relatively low energy-consumption levels and removal of the coarse fractions for remilling, or (2) preparation of stocks at relatively high energy-consumption levels and removal of fines to improve drainage properties. The advantages of the first procedure outweigh those of the second because the remilling of the coarse fibers could provide means of limiting the amount of fines produced. 2 tables, 9 figures, and 17 references. E.S.

SHIPPING CONTAINERS

ANON. Corrugated grapefruit box. Fibre Containers 35, no. 6: 58, 60 (June, 1950).

Reference is made to different types of corrugated boxes, half the size of a Bruce box, for shipping bagged grapefruit from Arizona to Chicago; the boxes were developed by the Department of Agriculture in co-operation with the Arizona Agricultural Experiment Station, Tucson, Ariz. In test shipments, half of one car was loaded with corrugated boxes, stacked five high in tiers, each tier separated about one inch from the next for ventilation;

the other half was filled with wirebound wooden boxes. In another car, one half was packed with corrugated boxes in the same way as in the first car; in the other half the containers were stacked solid to determine whether or not ventilation was necessary. The fruit from both cars arrived in excellent condition in Chicago; the paperboard boxes protected the fruit as well or even better than the wooden boxes. The corrugated boxes can be packed solidly in refrigerated cars without heating or other damage to the fruit; however, openings must be present in the box to prevent the formation of a musty odor. The cost of the corrugated box is substantially below that of wooden boxes; larger containers than those used in the tests would be still more economical. 1 illustration. E.S.

ANON. Some Hinde & Dauch boxes. Fibre Containers 35, no. 6: 72, 74 (June, 1950).

Examples are given to illustrate the variety of corrugated containers manufactured by the Hinde and Dauch Paper Co., Sandusky, Ohio, including the "Pallet Pak" for automobile carburetors; a box for a shotgun, separating the barrel from the polished stock; tool chests for children; and packages for different tools, either completely assembled or as individual units. 6 illustrations. E.S.

KOON, GORDON D. Flower pre-packaging. Modern Packaging 23, no. 10: 120-4, 200 (June, 1950); *cf.* B.I.P.C. 17: 724.

The author discusses the development of prepackaging cut flowers, based upon research at Ohio State University. Unit-package requirements and marketing techniques have been satisfactorily solved; the shipping container, on the other hand, and shipping procedures during extreme temperatures still present important problems. Tests with containers holding 24 individual overwrapped trays and different types of insulating materials were made. Thermocraft and Jiffy Blankets were almost equally efficient and far superior to old newspapers. Fiberglas liners were still more effective, but less economical with regard to weight. Regular ice, dry ice, and Super Ice were tested as refrigerants; dry ice appears to be the best answer to the problem, because it cools rapidly and does not damage the packages when it evaporates; however, the flowers must be protected from freezing. Arrangements for the correct application of the dry ice are discussed; no specific method can be recommended as entirely satisfactory. 1 table and 6 illustrations. E.S.

SHIPPING CONTAINERS—EXPORT PACKAGING

THE MARITIME ASSOCIATION OF THE PORT OF NEW YORK. *Packaging Committee.* Export packaging study. Part II. Analysis of outturn reports. Fibre Containers 35, no. 6: 55-6 (June, 1950); Paper Trade J. 130, no. 19: 36-7 (May 11, 1950); Am. Boxmaker 39, no. 6: 28-30 (June, 1950); Packaging Parade 18, no. 209: 92 (June, 1950); *cf.* B.I.P.C. 20: 590.

In this second report an analysis of the outturn reports at the time of discharge of the cargo at different ports throughout the world is presented. However, it should be borne in mind that additional damage and pilferage may be expected while the shipments are in transit from the foreign ports to their final destination. Data are given on the commodity groups showing damage (textiles, auto parts, glassware, food, agricultural equipment, and pharmaceuticals), the causes of damage (packaging, 65%; discharge, 15%; pilferage, 10%; stowage, 7%; and loading, 3%), and the condition of the

different containers (nailed wooden boxes; corrugated containers; solid fiber containers; cleated plywood boxes; cleated fiber panels; open and sheathed crates; wirebound boxes; steel, plywood, and fiber drums; wood barrels; compressed bales; bundles; and textile and paper bags). A large number of corrugated containers, particularly 200- and 275-pound cartons, were damaged, and the most important type of failure was at the closures. Very few solid fiber containers were damaged, which gives added support to the earlier observation that solid fiber appears to be better for export than corrugated. E.S.

SHIPPING CONTAINERS—MULTIWALL BAGS

ANON. Hammond Bag & Paper Co.'s Arkansas operations. Southern Pulp Paper Manuf. 13, no. 6: 36, 38 (June, 1950).

Brief reference is made to the Pine Bluff plant of the company, which was established in 1947 and produces multiwall bags of various types; part of the raw material is purchased from the Camden and Crossett paper mills. 3 illustrations. E.S.

SLIME PREVENTION

SHUMARD, R. S., STITT, W. D., WILHOYTE, H. J., CLAUSEN, I. A., and MARTIN, R. B. Slime control. Tappi 33, no. 6: 73-80A (June, 1950).

This is a panel discussion held by the Western Group of the Empire State Section of TAPPI. E.S.

SOLVENT CLEANING

GROOM, C. W. Chemical or solvent cleaning of boilers. Tappi 33, no. 6: 81A; discussion: 81-2A (June, 1950); *cf.* B.I.P.C. 19: 352.

The fundamentals of chemical cleaning are discussed briefly; the process can be used effectively not only on boilers, but also on other equipment (pipe lines, evaporators, heaters, etc.), when the following basic factors are understood: the scale to be removed, the solvent, the hookup, and the temperature and time of contact. Inhibited hydrochloric acid is the most generally used solvent, because it removes most, although not all, types of scale. E.S.

STARCH

KERR, RALPH W. Starch and its application in machine coatings. Tappi 33, no. 6: 268-71 (June, 1950).

The physical chemistry of starch in relation to its use as the adhesive in high-density coatings is discussed. It is proposed that minimum starch sol and color viscosities and maximum adhesive strength result when the physical bonds holding starch molecules are reduced in size uniformly to a given minimum level. The mode of action of acid, enzyme, and oxidants in reducing the size of starch molecules is compared. A weakening of the physical bonds in the granule superstructure follows as a secondary effect in these reactions, particularly in hydrolysis, from a reduction of the size of the molecules in the granular network. The action of aluminum chloride hexahydrate on starch in the dry state is to weaken the granular structure, depolymerize the starch molecules to the level suitable for adhesive applications, and alter the ratio of linear to branched polymer molecules in starch. The application of this reaction system has led to the production of starch adhesives of low viscosity and high adhesive strength suitable for use in high-density coating colors. The combination of the aluminum chloride reaction and enzymic conversion

is described for the production of high-density coatings suitable for machine application. 4 tables and 11 references. E.S.

STRAW

FRANCK, GEORGES, and ARONOVSKY, S. I. Straw pulp. Tappi 33, no. 6: 83-4A (June, 1950).

The procedures for cooking "prima" and "secunda" straw pulp for 9-point corrugating board in a French straw mill are listed; suggestions for improved cooking (*cf.* B.I.P.C. 19: 658) by the second author are given. E.S.

KRANCHER, CARL G., and PRICE, CARL E. Hydrapulper processing of straw. Tappi 33, no. 6: 275-7 (June, 1950); *cf.* B.I.P.C. 19: 658.

A description is given of a mill system which utilizes the Hydrapulper for pulping straw. Data are given on several experimental cooks and paper machine trials. 3 tables and 1 figure. E.S.

STREAM POLLUTION

FORUM ON INDUSTRIAL WASTE PROBLEMS. Paper mill wastes. Sewage Ind. Wastes 22, no. 6: 792-5; discussion: 795-6 (June, 1950).

In this general discussion of industrial waste problems from various sources, two papers were presented on paper mill wastes. Walter A. Lawrance in "Oxygen demand by permanganate method," p. 792-4, discussed the use of the permanganate method for controlling the pollution in the Androscoggin River, and Don E. Bloodgood in "Progress of studies," p. 794-5, reviewed some of the activities of the National Council for Stream Improvement. E.S.

JULLANDER, INGVAR, and OLSSON, BERTIL. Physico-chemical investigation of fly ash from pulverized coal. Svensk Papperstidn. 53, no. 8: 199-204 (April 30, 1950). [In English; German and Swedish summaries]

The sedimentation behavior of the fly ash from the burning of pulverized coal in a Swedish mill was investigated to determine whether or not it would be possible to dump the waste in the nearby river (Moälven). The river empties into a bay, about 1 km. below the mill; hence, it was imperative to find out if the greater part of the ash would be carried along this distance or be deposited at the river bottom prior to reaching the bay. The techniques and equipment used in this study are described in detail. The results of the experiments and calculations indicate that about 80% of the ash would settle at the river bottom, except during exceptionally high water conditions in the spring. 3 tables, 9 figures, and 4 references. E.S.

WINGET, R. Waste disposal problems and available treatment methods. Paper Mill News 73, no. 24: 76, 78, 80 (June 17, 1950).

The author discusses stream and air pollution problems in the kraft pulp and paper industry and possible abatement methods. E.S.

SULFITE PROCESS—AMMONIA BASE

THODE, E. F., and LEE, Y. H. Ammonia-base sulphite pulping of hardwoods. Tappi 33, no. 6: 257-60 (June, 1950).

The sulfite pulping of a mixture of commercially chipped birch, beech, and maple has been studied, using a two-stage ammonia-base process. A one-hour steaming period, a two-hour impregnation period, and a two- or more-hour cook constitute the digester cycle. Impregnation with 12% ammonium sulfite was carried out at 240 and 270° F. Cooking with 0.5 or 1.0% combined and about 5.2% total sulfur dioxide was accomplished at 295 and 320°. The chemical and physical properties of the resultant pulps are contrasted with those from a long single-stage ammonia-base cook, and with results of single-stage sodium- and calcium-base cooks reported by a previous investigator. The process appears comparable with a single-stage sodium-base sulfite cook and appears superior to a single-stage calcium-base cook. It is concluded that a good yield of papermaking pulp of satisfactory quality and bleachability may be obtained in a relatively rapid digester cycle using a two-stage ammonia-base sulfite cook. 3 tables and 10 references. E.S.

SULFITE PROCESS—MAGNESIUM BASE

BAKER, R. E., and HUTTON, FRANK. Magnesium-base sulphite pulping. Pulp Paper Mag. Can. 51, no. 6: 82-4 (May, 1950); *cf.* B.I.P.C. 20: 668.

The description given in this article is almost identical with that in the previous reference. E.S.

HAZELQUIST, SVARRE E., and ROGERS, CHARLES E. MgO sulfite recovery; a new report on its progress. Pulp & Paper 24, no. 7: 39, 102, 104, 107-8 (June, 1950); *cf.* B.I.P.C. 20: 668 and abstract above.

Brief reference is made to three operational changes in the Weyerhaeuser magnesium-base sulfite recovery system at Longview, which have been incorporated since the presentation of previous papers on this subject. During a nine-day period in March, an intensive survey was conducted covering the operation of the recovery system, at which time the plant operated at a rate equivalent to 322 airdry tons of unbleached, unscreened, unknotted pulp (permanganate number 13 by TAPPI standards) per day. Over this period it was necessary to add 39 pounds of magnesia and 93.7 pounds of sulfur as makeup per ton of pulp; 2100 pounds of total solids per ton were available at the furnace. An estimate of a feasible balance is presented which is economically attainable by minor changes in the present system; a brief outline of these changes is given. Under optimum conditions at Longview, the makeup of sulfur could thereby be reduced to 71 pounds (70% recovery) and that of magnesia to 18 pounds (88% recovery); 2350 pounds of total solids per ton would become available for firing at the furnace. These findings apply to the conditions and recovery equipment as they now exist in the Longview mill. 4 illustrations and 1 reference. E.S.

SULFITE WASTE LIQUOR

MURDOCK, HAROLD R. Industrial wastes. Ind. Eng. Chem. 42, no. 6: 71-2A (June, 1946).

The author discusses the effects which mandatory orders for the reduction of stream pollution by state authorities in Wisconsin and Washington are exerting upon the sulfite industry. Present efforts for abatement are reviewed, as well as the problems which make the economic disposal of sulfite waste liquor so difficult, notably the large quantities of water to be evaporated and the corrosiveness of the liquor. Biological disposal methods did not prove encouraging. If the industry is forced to reduce production to the natural

ability of the receiving streams to handle the sulfite waste liquor, it is doomed. A substitution of the kraft process may be one solution. E.S.

SCHOLANDER, AXEL. The significance of proper liquor displacement for the alcohol and evaporation plants. Norsk Skogind. 4, no. 3: 63, 65-71 (March, 1950). [In Swedish; English summary] *cf.* B.I.P.C. 20: 669.

The author discusses essentially the same topics as in the previous reference, although the two articles are not identical. 1 table, 15 diagrams, and 4 references. E.S.

SULFITE WASTE LIQUOR—OXIDATION

PEARL, IRWIN A. The oxidation of sulphite waste liquor lignin to aromatic organic chemicals. Tappi 33, no. 6: 263-7 (June, 1950).

A review of the subject is presented. 44 references. E.S.

SULFUR DIOXIDE

WEST, JAMES R., and GIUSTI, GINO P. The thermodynamic properties of sulfur dioxide. J. Phys. & Colloid Chem. 54, no. 5: 601-5 (May, 1950).

The authors extended the data on thermodynamic properties of sulfur dioxide of Rynning and Hurd (*cf.* Trans. Am. Inst. Chem. Engrs. 41: 265-81 [1945]) to 2000° F. 1 table and 4 references. E.S.

SWELLING AND HYDRATION

WILLIAMSON, HARRY. Paper and paperboard making. Part 1-3. Hydration. Paper Ind. 31, no. 12: 1431-3 (March, 1950); 32, no. 1: 50-2; no. 2: 167-9 (April, May, 1950).

The author defines "hydration" as that condition of the fiber developed by beating in the presence of water which, on drying, exerts a contracting and compacting force. As the water of hydration evaporates, the fibers are pulled and held in an increasingly dense continuity. Interspersed with comparisons of historical and modern papermaking, the major difference in the behavior of the stock on beating seed fibers and wood pulp is explained by their difference in α-cellulose content. All other operations in the making of a sheet of paper are interdependent on and affected by the degree of hydration developed by beating the fibers in the presence of water; the wet end of the paper machine is entirely governed by stock preparation. Paper is not made in the beater, but is made "in the beating." E.S.

SYNTHETIC FIBERS

HOWLETT, F. The structure of textile fibres. XIII. Synthetic polymer rayons. J. Textile Inst. 41, no. 3: P124-31 (March, 1950).

Following a brief discussion of the chemistry of synthetic fibers, the manufacture, properties, and uses of Vinyon, Orlon, nylon, Terylene, saran, polyethylene, and Pe Ce fibers are described. E.S.

TAILINGS

HAUG, ANTON J. Fines in the paper machine furnish. Paper Trade J. 130, no. 24: 122, 124 (June 15, 1950).

The author discusses the improved newsprint sheet properties (bulk, tear, opacity, Mullen, and tensile strength) when highly refined groundwood screenings from Haug refiners are added to the regular furnish. The refined stock in itself has little strength but superior binding qualities; it also results in a reduction of white-water losses. 4 charts and 6 photomicrographs. E.S.

TEXTILE INDUSTRY AND FABRICS—TESTING

WHITWELL, JOHN C., BOWEN, CAROL F., and TONER, RICHARD K. Moisture determination in textiles by electrical meters. Part IV. Textile Research J. 20, no. 6: 400-9 (June, 1950); *cf.* B.I.P.C. 20: 276.

Previous studies of the precision of various types of electrical moisture meters are extended to include meters for sheet materials (Hart moisture meter and Fielden Drimeter). The experimental results are analyzed in a manner similar to that previously used, and the techniques are extended to cover position and tension effects which could not be covered practically with the bulk materials previously used. The analysis of precision indicates the following: the Drimeter which is applicable to moving sheets, such as warps or fabrics, has a precision equal to that obtainable from drying ovens; the Hart meter, in which the sample is clamped between the electrodes, is approximately twice as precise as ovens. Precautions in the interpretation of these results are indicated. 5 tables, 6 figures, and 10 references. E.S.

TOOLS

ANON. Power tool drives studs and anchor bolts. Paper Ind. 32, no. 3: 276-7 (June, 1950).

Reference is made to the advantages of powder-actuated hand tools for seating studs and fasteners into metal, concrete, and masonry. The procedures and necessary precautions are outlined. 4 figures. E.S.

UPKEEP PAINTING

SHOBE, O. F. Mill painting and its relation to mill maintenance. Paper Mill News 73, no. 24: 74, 110 (June 17, 1950); Paper Trade J. 130, no. 24: 102, 104, 106 (June 15, 1950).

The author discusses the surface preparation over which the material is to be applied, paint systems for walls, structural steel and equipment, and finishing coats for wet areas. All up-to-date paint companies maintain staffs of skilled engineers which are available for consultation on all important industrial maintenance problems. E.S.

VENTILATION

ANON. Ross Engineering—builders of air systems. Paper Trade J. 130, no. 23: 19-22 (June 8, 1950).

A history of the J. O. Ross Engineering Corporation with its main office in New York and branch offices in the United States, Canada, and England is presented. The activities of the company in the pulp and paper industry are described, with particular reference to Ross heating and ventilating systems. 8 illustrations. E.S.

WAXES

MARSHALL, A. W. Comparison of melting point methods for wax. Anal. Chem. 22, no. 6: 842-4 (June, 1950).

A report is given on an investigation made of a number of methods of melting point determination as applied to various waxes, ranging from the paraffins of low melting point through the plastic microcrystalline and high-melting microcrystalline waxes, and including three representative oxidized hydrocarbon waxes. The procedures used in the investigated methods are outlined briefly, and references are given to more complete descriptions in the literature. A wide divergence was noticed between the A.S.T.M. petrolatum melting point and the other methods in the case of hard microcrystalline waxes, apparently caused by the high viscosity of the wax very close to the melting point. To clarify this effect, viscosities of a number of waxes were run in the modified Ostwald viscometer on both rising and falling temperature variations. The hard microcrystalline waxes were found to be subject to viscosity hysteresis at the melting point, whereas the other petroleum waxes were not. The viscosity data obtained indicated that the A.S.T.M. paraffin melting point most nearly represented the actual melting point of the microcrystallines and was about average for the crystalline and plastic waxes as well. The ring-and-plunger method was found to indicate the eutectic temperature of a wax, which is approximately the true value of the softening point. 1 table, 2 figures, and 8 references. J.A.B.

WEATHER FORECASTING

PORTER, JOHN M. Utilization of weather information by the pulp and paper industry. Paper Mill News 73, no. 24: 120, 134 (June 17, 1950); Paper Trade J. 130, no. 24: 94, 96 (June 15, 1950); Paper Ind. 32, no. 4: 427-8 (July, 1950).

The author discusses the type of weather information which is now available and which will prove of interest to the pulp and paper industry: (1) fire weather forecasts for protecting the large timber holdings, (2) quantitative precipitation forecasts to determine changes in water supply, particularly where dams and hydraulic power are used, and (3) climatological information for the region in which the mill is located to determine the available water supply on a long-range basis and to study the effect of unusual water conditions on the supply of raw material. E.S.

WET STRENGTH

HANSEN, OTTO. Significance of melamine resins in the paper industry. Das Papier 4, no. 9/10: 137-44 (May, 1950). [In German]

The author discusses the constitution and production of methylolmelamine (I), its polymerization and utilization in the paper industry, its effect on the physical properties of pulp (with appropriate tabulated data), the recovery of waste paper containing (I) resins, and methods for detecting (I) in paper. The formation and utilization of partially etherified water-insoluble (I) resins are described. The latter, when added to the beater, are not immediately hydrophobic. The treated sheets however, can take ink, and serve as washable table cloths, wall paper, and raincoats. 1 table, 14 figures, and 21 references. L.E.W.

WHITE WATER

JOP. White-water recovery. Wochbl. Papierfabr. 78, no. 8: 214 (April 30, 1950). [In German]

No mill can afford nowadays to operate without a white water-recovery system; however, less attention is given to the equally important limitation of fresh-water additions. The author points out several possibilities for fresh-water savings in beater and paper-machine operation. White-water systems

give satisfactory results only when they are sufficiently large to handle the waste-water quantities involved. Hence, a reduction in the fresh-water quantities will result in an increased efficiency of the white-water system.
E.S.

WOOD—CHEMISTRY

LEWIS, HARRY F. The significant chemical components of western hemlock, Douglas fir, western red cedar, loblolly pine, and black spruce. Tappi 33, no. 6: 299-301 (June, 1950); *cf.* B.I.P.C. 20: 488-90.

A study has been made of the chemical components of selected samples of Douglas fir, western hemlock, western red cedar, black spruce, and loblolly pine. Douglas fir and loblolly pine are characterized by higher α-cellulose and lower hemicellulose B contents than are the other three woods. The three western woods are lower in pentosan than is the case with the spruce and pine. An unusually high percentage of the uronic acid content of the Douglas fir remains in the α-cellulose isolated from that wood. Western red cedar is characterized by the high lignin content of the extractive-free wood and by the high extractive content of the wood. 2 tables and 2 references.
E.S.

WOOD—EXTRACTIVES

ALVAREZ-NÓVOA, JOSÉ C., ERDTMAN, HOLGER, and LINDSTEDT, GÖSTA. Constituents of pine heartwood. XVIII. A note on cryptostrobin, an isomer of strobopinin from the heartwood of *Pinus strobus* L. Acta Chem. Scand. 4, no. 2: 390-1 (1950). [In English] *cf.* B.I.P.C. 20: 751.

When strobopinin (I) was isolated from the acetone extract of white pine, the mother liquor gave an isomer, $C_{16}H_{14}O_4$ (containing no methoxyl, but having one methoxyl group), melting at 202-203° C., $[\alpha]^{20}_D$ −33°. Up to the present there is no assurance that this compound is actually a component of the heartwood. It may be formed by the rearrangement of the strobopinin. 4 references.
L.E.W.

WOOD—PULP YIELD AND QUALITY

KLEM, GUSTAV G. Specific gravity of spruce wood, its variation in wood structure and pulp degree of delignification (Sieber chlorine no.) and the effect of these factors on yield and sulphite pulp quality. Norsk Skogind. 4, no. 4: 78-88 (April, 1950). [In English; Norwegian summary] *cf.* B.I.P.C. 17: 45-6.

This is an extended English summary of the data on the sulfite cooking experiments previously published as Meddelelse Nr. 20 of the Papirindustriens Forskningsinstitutt (or Meddelelse Nr. 31 of Det norske Skogforsøksvesen). 6 tables. For the bibliography, the original publication must be consulted.
E.S.

NISSEN, Ø., KLEM, G. G., and KARLSEN, O. Supplement to Klem's paper on pulp yield and quality. Norsk Skogind. 4, no. 4: 88-9 (April, 1950). [In English]

In the preceding paper, the effect of the Sieber chlorine number and specific gravity on pulp yield and quality was studied by a multiple correlation method. This method of statistical analysis is not especially suitable for the data in

question. A statistical analysis in two steps is outlined and the data of Table 3 are recalculated by this method. The correlation coefficients and average regression coefficients within samples, and the regressions between specific gravity and the adjusted pulp data are presented in two tables. The new method gives more accurate values. E.S.

WOOD OPERATIONS

MCNALLY, J. A. Quebec equipment trends. Pulp & Paper 24, no. 7: 84 (June, 1950).

The semi-trailer hauling operations of the Brown Corp. (involving the movement of 3,500,000 cu. ft. of fire-killed black spruce and balsam pulpwood) in the St. Maurice headwaters country in Quebec are described; special emphasis was placed on securing a proper balance and synchronization of loading, hauling, and unloading units. 4 illustrations. E.S.

WOOD ROOM

EDWARDES, VANCE P. Wood room losses and their control. Paper Mill News 73, no. 24: 88, 92 (June 17, 1950); Paper Trade J. 130, no. 24: 92, 94 (June 15, 1950); Can. Pulp Paper Ind. 3, no. 7: 9-10 (July, 1950).

The author discusses possible savings in woodroom operations, including barking, sawing, cleaning, and chipping. Reference is also made to stream pollution through woodroom waste. In a mill handling 500 cords per day, the solids in the sewered water from the bark press amount to 13,000 pounds of wood fines and 6000 pounds of bark per day, whereas the fiber losses of the entire mill (pulp and paper mill and bleach plant) amount to an average of 19,000 pounds. Most of these fines can be removed by screens and burned after pressing. This operation will scarcely pay for itself, but it will greatly reduce stream pollution. E.S.

WOOL, ARTIFICIAL

WORMELL, R. L. The structure of textile fibres. XI. Fibres made from dispersed proteins. J. Textile Inst. 41, no. 1: P16-28 (January, 1950); *cf.* B.I.P.C. 20: 660.

The importance of the carboxyl, amino, amide, and cystine groups in the preparation of fibers from protein is discussed; the influence of the molecular size is pointed out, and the fine structure of protein is described briefly. 1 diagram and 3 x-ray photographs. E.S.

X-RAY RESEARCH

HERMANS, P. H., and WEIDINGER, A. Quantitative investigation of x-ray diffraction by "amorphous" polymers and some other noncrystalline substances. J. Polymer Sci. 5, no. 3: 269-81 (June, 1950).

A method for the quantitative evaluation of monochromatic x-ray diffraction pictures of cellulosic fibers which will be described by the authors in a forthcoming publication, has been used to compare the intensity distribution attributed to noncrystalline cellulose with that given by other noncrystalline substances. The intensity-distribution curves, corrected for incoherent radiation and reduced to standard conditions of intensity and irradiated mass, show constant integrated intensity, irrespective of the atomic composition of the polymer. Amorphous cellulose exhibits the largest degree of disordering of all polymers investigated. The method has been extended to indicate hydrogen bonding in the noncrystalline portion of nonhalogen polymers. 1 table, 10 figures, and 4 references. J.O.T.

SEGAL, LEON, CREELY, JOSEPH J., and CONRAD, CARL M. A rotating specimen mount for use with x-ray spectrometer in measuring crystallite orientation of cellulosic and other textile fibers. Rev. Sci. Instruments 21, no. 5: 431-5 (May, 1950).

The quantitative evaluation of crystallite orientation in textile fibers by x-ray methods is discussed. It is found that photographic recording and photometering of the resulting films can be replaced by automatic recording on a strip chart with the aid of an x-ray spectrometer with a Geiger-Mueller counter. The design and details are given for a specimen holder capable of properly positioning and rotating a bundle of fibers in the x-ray beam so that the 002 or some other selected diffraction arc passes before the window of the counter. A tentative procedure is outlined for evaluating, with the aid of this apparatus, the crystallite orientation of a bundle of cellulose fibers. Some typical recordings of the intensity curves of the 002 arcs from ramie, cotton, and high tenacity rayon are presented. 8 diagrams and 10 references.

E.S.

Patent Section

Although the abstracts of the United States patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. The abstracts of the Canadian patents are prepared from the claims published in the* Canadian Patent Office Record. *In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Until the printing branch is in full operation and up to date, the printing of specifications will be several months behind.

ADHESIVES

CARSON, CLARENCE M. Adhesive. U. S. patent 2,496,934. Filed Oct. 26, 1945. Issued Feb. 7, 1950. 2 claims. Assigned to Wingfoot Corporation. [Cl. 260-752]

A nondrying adhesive comprises about 33.3-75 parts of ethylene glycol dimer (marketed under the trade name of Glycol Polyester) and 25-66.7 parts of resinous cyclized rubber. The product is suitable for the lamination of fabrics, metal foils, plastic sheets, and paper (including glassine and waxed paper). E.G.S.

RIDER, STUART H. Modified methylol melamine resins. U. S. patent 2,482,508. Filed Aug. 21, 1946. Issued Sept. 20, 1949. 8 claims. Assigned to Monsanto Chemical Company. [Cl. 260-67.6]

One mole of the methyl ether of hexamethylolmelamine reacts with 0.2-3 moles of dimethyl diethyl orthosilicate at 100-200° C. to form a resinous product which is suitable for impregnating paper, glass, and textile webs for use in laminates. E.G.S.

BLEACHING—GROUNDWOOD

MCEWEN, ROBERT L., and SHELDON, FRED R. Method of bleaching groundwood. U. S. patent 2,510,595. Filed Sept. 20, 1946. Issued June 6, 1950. 2 claims. Assigned to Buffalo Electro-Chemical Company, Inc. [Cl. 8-104]

This is similar to Canadian patent 453,804; *cf.* B.I.P.C. 19: 443. E.G.S.

BOARD SPECIALTIES

CLEMENTS, MACMILLAN. Structural panel. U. S. patent 2,511,620. Filed April 16, 1948. Issued June 13, 1950. 2 claims. [Cl. 20-91]

A hollow door panel incorporates a low-density, gridlike core which is

formed from interfitted strips of 275-pound test corrugated board. The hollow core is covered with hardboard, veneer, plywood, or sheet metal facing sheets. E.G.S.

GAUTHIER, JOSEPH H. Felted wood fibre machinable cork substitute material. Canadian patent 465,455. Filed Dec. 11, 1945. Issued May 30, 1950. 1 claim.

A felted wood fiber cork-substitute material comprises about 80% of substantially acid-free coniferous fibers, excluding red fir, redwood, and red and white cedar, and about 20% of partially hydrated chemical wood pulp; the material is formed into a felted sheet about ⅜ inch thick, which has a density of 20-24 lb. per cu. ft. The product is suitable for use as heeling board in the manufacture of shoes. E.G.S.

GENTILE, VINCENZO J. Book match cover. U. S. patent 2,510,217. Filed Nov. 5, 1946. Issued June 6, 1950. 2 claims. [Cl. 206-29]

A moisture-resistant cardboard cover for book matches is adapted to receive a package of paper matches so that the match heads are located in a pocket and are not exposed to accidental ignition. E.G.S.

HURNDELL, ALLAN. Show stand display container. U. S. patent 2,512,546. Filed Oct. 4, 1946. Issued June 20, 1950. 3 claims. Assigned one half to Robertson & Woodcock Limited. [Cl. 206-44.11]

This corresponds to Canadian patent 450,644; *cf.* B.I.P.C. 19: 60. E.G.S.

MENDE, WILLIAM C. Applicator. U. S. patent 2,509,241. Filed May 10, 1947. Issued May 30, 1950. 1 claim. Assigned to Ortho Pharmaceutical Corporation. [Cl. 128-270; changed to 128-263]

A cardboard applicator is adapted to the application of medicants and catamenial tampons. E.G.S.

PEIKER, WALTER L. Paperboard serving tray. U. S. patent 2,512,963. Filed Oct. 11, 1948. Issued June 27, 1950. 1 claim. Assigned to Continental Paper Products Company. [Cl. 229-28]

A disposable, paperboard serving tray for foods and beverages comprises a shallow, rectangular box which is provided with cutout areas to accommodate cups, straws, spoons, and the like. E.G.S.

PITYO, ALBERT F., and BUTTERFIELD, HARRY. Method of forming hemispherical globe sections. U. S. patent 2,510,215. Filed May 12, 1947. Issued June 6, 1950. 4 claims. [Cl. 154-110]

A method is described for forming or pressing a hemispherical section of a geographical globe under heat and pressure. Each globe section includes an inner layer of cardboard, an intermediate layer of smooth or dense paper, and an outer protective layer of a plastic material such as cellulose acetate. E.G.S.

WOODWARD, WILLIAM W. Drip tray. U. S. patent 2,511,189. Filed Aug. 23, 1949. Issued June 13, 1950. 5 claims. Assigned to The Fairfield Paper and Container Company. [Cl. 229-23]

A paperboard or corrugated board drip tray is designed to catch crankcase drippings when placed under a car. E.G.S.

CELLULOSE ETHERS

WALDECK, WILLIAM F. Manufacture of carboxymethylcellulose. U. S. patent 2,510,355. Filed Nov. 20, 1947. Issued June 6, 1950. 6 claims. Assigned to Wyandotte Chemicals Corporation. [Cl. 260-231]

Carboxymethylcellulose is formed by the reaction of cellulose with caustic soda and sodium chloroacetate (formed *in situ* from chloroacetic acid and sodium carbonate). The process includes the steps of tumbling comminuted cellulose which passes a 40-mesh screen and has a bulk density of at least 5 lb./cu. ft.; spraying the tumbling mass with a 50% aqueous caustic soda solution; adding sufficient sodium bicarbonate to neutralize the excess caustic soda after the spraying has been completed; and continuing the tumbling operation. E.G.S.

CHLORINE DIOXIDE

HALLER, JOHN F. Manufacture of chlorine dioxide. U. S. patent 2,510,034. Filed Jan. 13, 1948. Issued May 30, 1950. 4 claims. Assigned to Mathieson Chemical Corporation. [Cl. 23-152]

Chlorine dioxide is generated by the reaction of an acidified aqueous solution of sodium chlorate with sulfur dioxide in the presence of an inert diluent gas. The acidified solution is maintained at a pH below 2 and at a chlorate concentration below 10% (calculated as sodium chlorate, on an acid-free basis); the reaction temperature is held within the range of 60-75° C. E.G.S.

COMBINATION PACKAGES

CLEARY, WILLIAM H. Dual-purpose container. U. S. patent 2,510,211. Filed Aug. 6, 1947. Issued June 6, 1950. 3 claims. Assigned one half to John D. Shourt. [Cl. 229-15]

A dual-purpose paper container for cake and ice cream is chemically treated to withstand baking temperatures. It is contemplated that a cake will be baked in the lower portion of the container, a partition inserted over the cake, and a quantity of ice cream frozen in position over the partition. The filled container may be placed in a freezing chamber for storage. E.G.S.

MORELL, JAMES A. Combined cigarette and match package. Canadian patent 465,778. Filed April 29, 1947. Issued June 13, 1950. 3 claims.

A strip of paper matches is attached to the under side of the closure flap of a rectangular box-and-sleeve type cigarette package. E.G.S.

TERRY, JOHN F. Special package. U. S. patent 2,512,001. Filed Aug. 21, 1947. Issued June 20, 1950. 5 claims. [Cl. 206-47; changed to 132-79]

A conventional box structure houses and protects a sealed, flexible-walled container of glassine paper, cellophane, or other suitable material, preferably transparent or translucent. The container is of an ordinary envelope form and is designed for the packaging of a unitary assembly of separate toilet articles. E.G.S.

DE-INKING

HILL, HAROLD S., and COGHILL, JAMES T. Method and apparatus for processing fibrous pulp. Canadian patent 465,565. Filed Aug. 1, 1947. Issued May 30, 1950. 37 claims. Assigned to Price Brothers & Company, Ltd.

A method of deinking printed paper stock comprises forming and compressing a layer of completely disintegrated printed stock between two opposed working surfaces, at least one of which is perforated; imparting a gyratory motion to the two surfaces; and washing the desired fraction of ink particles from the agitated stock with an excess of liquid. E.G.S.

DIELECTRICS

HILL, LAWRENCE R., BINDSCHADLER, ERNEST, and CAMPBELL, JOHN A. Insulation. Canadian patent 466,147. Filed Dec. 28, 1945. Issued June 27, 1950. 5 claims. Assigned to Canadian Westinghouse Company, Limited.

This is the same as U. S. patent 2,479,357; *cf.* B.I.P.C. 20: 55. E.G.S.

DISPENSING CONTAINERS

LUNDBERG, JACOB O. Dispensing container. U. S. patent 2,511,442. Filed Dec. 20, 1946. Issued June 13, 1950. 1 claim. [Cl. 206-57]

A dispensing container consists of a band of paper, cardboard, or the like which surrounds a stacked pile of paper in a housing; the band is open at the sides and has a slit or opening in the front wall through which the paper can be removed. E.G.S.

TELSCHOW, WILLIAM F. Package spout. U. S. patent 2,510,530. Filed June 18, 1945. Issued June 6, 1950. 8 claims. Assigned to Colgate-Palmolive-Peet Company. [Cl. 222-81]

A metal puncturing device and dispensing spout for a cardboard container is shaped so that it is guided by a wall of the container during insertion and is frictionally engaged and retained by the same wall after insertion. E.G.S.

FOLDING BOXES

ABRAMS, ALBERT A. Self-locking carton. U. S. patent 2,511,523. Filed March 18, 1947. Issued June 13, 1950. 4 claims. [Cl. 229-45; changed to 229-33]

The cover of a self-locking, sealable, paperboard carton is provided with one or more projecting tongues which releasably interlock with corresponding slots or recesses in the side walls. E.G.S.

ALLEN, WILLIAM H. Cellular carton. U. S. patent 2,512,991. Filed Jan. 20, 1948. Issued June 27, 1950. 10 claims. Assigned to United Board & Carton Corporation. [Cl. 229-28; changed to 229-29]

A cellular, cardboard egg container is designed to support the eggs in such a way as to provide adequate cushioning and minimize breakage with the least material and simplest assembly. E.G.S.

BELL, JOHN G. Container. U. S. patent 2,512,602. Filed Feb. 19, 1947. Issued June 27, 1950. 13 claims. Assigned to Morris Paper Mills. [Cl. 229-5.5]

A multiwall cardboard container for ice cream and other food products is designed to afford protection to the contents, in that damage to the outer wall will not necessarily affect the inner wall. The air space between the walls is said to improve the insulating properties of the container. E.G.S.

BENOIT, LEON. Cellular carton. Canadian patent 465,580. Filed May 1, 1948. Issued May 30, 1950. 4 claims. Assigned to Somerville Limited.

This is the same as U. S. patent 2,455,291; *cf.* B.I.P.C. 19:366. E.G.S.

BUERGER, WILLIAM J. Collapsible box. U. S. patent 2,513,079. Filed Aug. 27, 1949. Issued June 27, 1950. 4 claims. Assigned to The Dayton Folding Box Company. [Cl. 229-41]

The blanks for a collapsible paper carton or box are laid out in such a manner that a pair of blanks may be arranged in reverse position and cut from a single rectangular sheet of board or from a roll with a minimum of waste. E.G.S.

DUNNING, ROBERT M. Carton pouring spout. U. S. patent 2,509,289. Filed Sept. 26, 1946. Issued May 30, 1950. 2 claims. Assigned to Waldorf Paper Products Company. [Cl. 229-17]

A pouring spout is formed from three adjoining panels of a carton. A perforated line is provided near the upper edge of the carton; the line extends across a side panel of the carton and continues partially across the two adjoining wall panels. The spout may be separated along its upper edge from the remainder of the panels in which it is formed by pressing the carton stock inwardly along the perforations; by pressing on opposite sides of the carton below the perforated line, the spout may be folded into a projecting position. E.G.S.

PAULDER, WILLIAM A. Pull-tab style folding carton. Canadian patent 465,986. Filed Aug. 30, 1947. Issued June 20, 1950. 5 claims. Assigned to Dominion Envelopes & Cartons (Western) Limited.

The cover of a pull-tab style folding carton is scored along its front edge to facilitate the opening of the carton. E.G.S.

RAFOTH, BENNIE A., and WAUDA, GEORGE E. Carton. U. S. patent 2,509,616. Filed Nov. 14, 1947. Issued May 30, 1950. 1 claim. Assigned to Marathon Corporation. [Cl. 229-36]

The outer wall of a cardboard ice cream carton is provided with a pocket which is adapted to hold a flat wooden spoon. E.G.S.

RINGLER, WILLIAM A. Container for solid and liquid food products. U. S. patent 2,512,383. Filed Nov. 10, 1947. Issued June 20, 1950. 8 claims. Assigned to The Gardner Board and Carton Co. [Cl. 229-45]

A container for solid and liquid foods (e.g., ice cream, sherbet, milk, etc.) is provided with a fin-and-ear type closure which is sealed by a relatively weak sealing substance. A hermetic seal is preserved by the prevention of the relative movement of the parts involved in the seal. E.G.S.

RINGLER, WILLIAM A. Method of forming collapsible containers. U. S. patent 2,512,382. Filed Sept. 8, 1945. Issued June 20, 1950. 5 claims. Assigned to The Gardner Board and Carton Co. [Cl. 93-51]

A method and device are provided for forming and setting up liquid-tight paperboard cartons or containers of the knockdown type; the containers are adapted for the packaging of frozen foods, ice cream, and the like. E.G.S.

HEATING (HIGH-FREQUENCY)

COHOE, WALLACE P., and SASLAW, MAX R. Method and apparatus for drying sheet materials. Canadian patent 465,547. Filed March 15, 1946. Issued May 30, 1950. 13 claims. Assigned to Fred'k H. Levey Company, Inc.

This corresponds to U. S. patent 2,459,623; *cf.* B.I.P.C. 19: 446. E.G.S.

DAVIS, MAURICE F. High-frequency heating apparatus. U. S. patent 2,512,311. Filed Sept. 1, 1948. Issued June 20, 1950. 5 claims. Assigned to General Electric Company. [Cl. 219-47]

A high-frequency apparatus employs electrodes for the continuous heating of elongated materials, such as textiles, rubber, plastics, paper, and the like. Means are provided for the prevention of electric arcing and corona discharge from the electrodes. E.G.S.

INSULATION AND INSULATING MATERIALS

WALTER, HENRY E. Manufacture of fibre felts. Canadian patent 465,911. Filed Dec. 24, 1946. Issued June 13, 1950. 4 claims. Assigned to Wood Conversion Company.

A method is described for the manufacture of a porous, resilient, bonded wood fiber blanketlike felt; the process involves the continuous formation of a substantially uniform, unfelted mat of cellulosic fibers which carry an aqueous thermosetting binder material; the subjection of the mat to a series of densifying compressions of increasing magnitude, together with alternate releases from compression; and the drying of the released mat at a thermosetting temperature of the binder material in order to bond the resulting rearranged fibers. E.G.S.

INTERIOR PACKING

ANDERSON, WILBUR G., JR. Furniture corner protector. U. S. patent 2,509,468. Filed July 11, 1949. Issued May 30, 1950. 7 claims. Assigned to American Box Board Company. [Cl. 229-14]

A paperboard furniture-corner protector is slotted and scored so that it can be quickly folded into a completed three-sided protector. E.G.S.

DAVIS, STANLEY H., MIDDLESWORTH, LOUIS F., and MILSTEIN, ARTHUR L. Article holding insert for containers. U. S. patent 2,511,569. Filed July 2, 1949. Issued June 13, 1950. 15 claims.

Assigned to The S. H. Davis Paper Box Company. [Cl. 206-65]

A stiff paper liner is adapted for use in paperboard boxes or other containers for hollow glassware and the like. E.G.S.

MONAHAN, CLEMENT L. Cradle egg carton. U. S. patent 2,512,111. Filed Jan. 23, 1947. Issued June 20, 1950. 2 claims. [Cl. 229-28]

A cardboard egg carton is constructed so as to be inherently shock absorbing, thus protecting the eggs within the carton against breakage. E.G.S.

RAU, ERIC J. Flatware tray. U. S. patent 2,511,542. Filed Aug. 14, 1948. Issued June 13, 1950. 9 claims. Assigned to Container Corporation of America. [Cl. 206-45.19]

A traylike paperboard container and insert construction is designed to hold flatware articles securely in place during shipment and handling. E.G.S.

MACHINERY—CONVERTING MACHINERY

AVERY, TRUE M., and BOKENKROGER, WILLIAM H. Bag handle making and applying machine. Canadian patent 465,599. Filed April 21, 1948. Issued May 30, 1950. 36 claims. Assigned to Union Bag & Paper Corporation.

Equipment is described for the formation of bag handles from strips of multi-ply paper tape; means are included for attaching the handles to preformed bags. E.G.S.

EKSTEDT, JOHN W., PITYO, ALBERT F., and BUTTERFIELD, HARRY. Method of and apparatus for forming blanks. U. S. patent 2,510,214. Filed Feb. 17, 1947. Issued June 6, 1950. 9 claims. [Cl. 18-19]

Each hemispherical section of a geographical globe is formed from a circular paper blank, which consists of a smooth, hard, or dense outer layer and a highly porous, absorbent inner layer. The layers are impregnated with a thermosetting phenolic resin. E.G.S.

FOURNESS, CHARLES A. Wadding decompressor. Canadian patent 465,559. Filed Jan. 23, 1947. Issued May 30, 1950. 4 claims. Assigned to Paper Patents Company.

A method is described for the re-expansion of a strip of longitudinally compressed, multi-ply, creped wadding; a tensional force is applied uniformly across the strip without compressing it, and the movement of the strip is retarded by compressing the strip slightly in a direction perpendicular to its plane, along its path of travel. E.G.S.

GROUSE, RICHARD A. Apparatus for the manufacture of metallized paper for electric condensers. Canadian patent 465,540. Filed June 27, 1946. Issued May 30, 1950. 7 claims. Assigned to A. H. Hunt Limited.

An apparatus is described for the production of a paper-sheet dielectric which is partially metallized on one face. E.G.S.

JOA, CURT G. Bat forming machine and method. U. S. patent 2,510,229. Filed April 19, 1948. Issued June 6, 1950. 22 claims. [Cl. 154-29]

A method and apparatus are described for the continuous on-edge assembly of a bat of wood fiber, commercial cellucotton, or the like; means are provided for closely controlling the density of the bats. E.G.S.

KLOCK, GEORGE E. Method and apparatus for making loop-equipped sanitary napkins. U. S. patent 2,510,638. Filed July 24, 1947. Issued June 6, 1950. 21 claims. Assigned to International Cellucotton Products Company. [Cl. 112-203]

Means are provided for the manufacture of a sanitary napkin which is equipped with attachment loops at both ends. E.G.S.

PERILLI, LOUIS. Machine for setting up box blanks. U. S. patent 2,510,251. Filed Feb. 15, 1947. Issued June 6, 1950. 19 claims. Assigned to Associated Folding Box Co. [Cl. 93-53]

Machinery is provided for feeding rectangular box blanks from a magazine along a predetermined path, and for opening and interengaging the side and end walls while supporting the blanks. E.G.S.

SCHINDLER, WALTER R. Machine for manufacturing paper plant protectors. U. S. patent 2,511,417. Filed Dec. 31, 1948. Issued June 13, 1950. 7 claims. Assigned to Hot Kap Manufacturing Company. [Cl. 93-1]

A machine is described for the manufacture of a wire-reinforced paper tent which can be placed over young growing plants to protect them from the weather. E.G.S.

STEVENS, HENRY W., and HECKER, LEONARD R. Window bag and method and apparatus for making same. U. S. patent 2,511,303. Filed Sept. 9, 1946. Issued June 13, 1950. 3 claims. Assigned to Benj. C. Betner Company. [Cl. 154-37]

A process for forming window-bag material comprises the steps of feeding two webs of suitable bag material (e.g., paper, glassine, and the like) in face-to-face contact, die-cutting the desired window aperture in both webs as a unit, separating the webs for travel along spaced paths, and then directing the webs so as to return them to closely spaced paths. The separation of the webs after the die-cutting operation provides space for a supply of transparent window material; the transparent web is sandwiched between the two die-cut webs at the point at which they reconvene. E.G.S.

MACHINERY—CURLATOR

COGHILL, JAMES T., and HILL, HAROLD S. Apparatus for treating wood pulp and the like. Canadian patent 465,518. Filed Aug. 6, 1947. Issued May 30, 1950. 29 claims. Assigned to Consolidated Machine Tool Corporation.

A disk refiner is provided with means for imparting a gyratory motion to the working surfaces of the disks and for maintaining a controlled pressure on the pulp as it passes between the disks. E.G.S.

MACHINERY—PACKAGING MACHINERY

DEARSLEY, GEORGE. Packet making or other machines comprising intermittently rotatable disks or turrets. U. S. patent 2,512,922. Filed Oct. 29, 1947. Issued June 27, 1950. 1 claim. Assigned to Molins Machine Company Limited. [Cl. 93-6; changed to 93-84]

A machine for the packaging of cigarettes includes means for folding a foil-lined paper blank around a mandrel and securing it to form an open-end cup or pocket. E.G.S.

SALFISBERG, LEROY L. Web feeding device. U. S. patent 2,512,216. Filed May 31, 1946. Issued June 20, 1950. 15 claims. Assigned to Ivers-Lee Company. [Cl. 271-2.6]

Equipment is described for the wrapping or packaging of powders, granular materials, or small articles between two continuous webs of a thin sheet material (e.g., metallic foil, paper, cellophane, Pliofilm, and the like). The feed of the packaging material can be periodically increased or decreased as desired. E.G.S.

SANDBERG, OSCAR. Packaging machine for candy, cookies, and the like. U. S. patent 2,512,074. Filed Sept. 18, 1946. Issued June 20, 1950. 1 claim. Assigned to Lynch Package Machinery Corporation. [Cl. 93-1]

A mechanism is provided for feeding cards and heavy paper "boats" (i.e., U-shaped strips) to a packaging machine for candy, cakes, and the like. E.G.S.

SMITH, ARTHUR R., LEE, GEORGE A., and HOPKINS, CYRIL J. Machine for packeting small measured quantities of seed or granular or powdered materials in paper envelopes. U. S. patent 2,509,320. Filed Oct. 3, 1946. Issued May 30, 1950. 3 claims. [Cl. 226-49]

A machine is provided for the packaging of small measured quantities of seeds or other granular or powdered materials in paper envelopes. E.G.S.

MACHINERY—PAPER MACHINE—CYLINDER MOLD

STAEGE, STEPHEN A. Paper machinery. Canadian patent 465,816. Filed July 15, 1947. Issued June 13, 1950. 19 claims. Assigned to The Black-Clawson Company.

A stock-supply system for a cylinder machine incorporates a stock inlet passage which is the same width as the cylinder mold; a discharge orifice is provided for the supply of stock to the inlet passage; the walls of the stock inlet form a venturi with the orifice for the dissipation with minimum turbulence of the velocity energy of the stock as it enters the inlet passage through the orifice. E.G.S.

MACHINERY—PRESSES

HORNBOSTEL, LLOYD. Press roll assembly. U. S. patent 2,512,648. Filed May 5, 1945. Issued June 27, 1950. 2 claims. Assigned to Beloit Iron Works. [Cl. 92-49]

A fluid pressure-controlled horizontal press assembly is provided with a

stationarily mounted middle roll and pivotally mounted outer rolls; the fluid pressure-actuated means are employed for the determination and maintenance of the proper degree of pressure between the various rolls. E.G.S.

MALKIN, BERNARD A. Press for paper making machines. Canadian patent 465,682. Filed Nov. 27, 1947. Issued June 6, 1950. 2 claims. Assigned to Dominion Engineering Works Limited.

A press for papermaking machines comprises a base, three laterally arranged bottom press rolls, and two top press rolls which are arranged so that each roll lies between and is supported on two adjacent bottom rolls. The intermediate bottom roll is a suction roll which is provided with circumferentially spaced first and second suction areas; the first suction area is located just behind the nip provided by the intermediate bottom roll and the first of the two top rolls; the second area is located just in advance of the nip between the intermediate bottom roll and the second top roll. E.G.S.

MACHINERY—PULPERS

LAVISTE, CORNELIUS. Means for defibrating and grinding paper pulp or other fibrous material. Canadian patent 465,584. Filed July 15, 1948. Issued May 30, 1950. 7 claims. Assigned to Svenska Cellulosa Aktiebolaget.

A knife disk of a disk refiner incorporates knife elements which are arranged so that virtually the entire disk is provided with openings for the axial flow of pulp from the pulp inlet to the pulp outlet. E.G.S.

MACHINERY—SCREENS

HAUG, ANTON J. Drainer. Canadian patents 466,087 and 466,088. Filed June 29, 1945 and July 30, 1949. Issued June 27, 1950. 8 and 5 claims.

These are combined in U. S. patent 2,483,200; *cf.* B.I.P.C. 20: 144. E.G.S.

MACHINERY—SLITTERS AND WINDERS

KWITEK, GEORGE M. Paper winding machine sealing mechanism. U. S. patent 2,512,900. Filed April 21, 1948. Issued June 27, 1950. 12 claims. Assigned one half to Edwin M. Kwitek and one fourth to Reuben J. Pech. [Cl. 242-56]

A paper winding machine is equipped with means for sealing both ends of a severed web immediately after its severance, so that the outer or upper end of the web is sealed to the completed paper roll, while the inner or lower end is sealed or attached to the new or unfilled core. E.G.S.

MACHINERY—SUCTION BOXES

LAVANCHY, JEAN. Machine for making sheets from a pulp. Canadian patent 466,045. Filed May 18, 1948. Issued June 20, 1950. 15 claims. Assigned to Sulzer Frères, Société Anonyme.

A papermaking machine includes means for automatically reducing the vacuum on a suction box when there is no paper web on the wire. E.G.S.

MACHINERY—THICKENERS

RICHTER, JOHAN C. F. C. Suction filter. U. S. patent 2,510,254.

Filed Nov. 26, 1945. Issued June 6, 1950. 5 claims. Assigned to Aktiebolaget Kamyr. [Cl. 210-199]

This corresponds to Canadian patent 452,267; *cf.* B.I.P.C. 19: 291. E.G.S.

NITRIC ACID PROCESS

BATE, STANLEY C. Production of cellulose. U. S. patent 2,511,096. Filed Oct. 11, 1944. Issued June 13, 1950. 9 claims. Assigned to Celanese Corporation of America. [Cl. 92-9]

Cellulose is produced from lignocellulosic materials (e.g., elm and Scotch fir sawdust, chopped straw, etc.) by digesting the materials at 70-110° C. for not longer than six hours with 5-20 times their weight of a mixture of nitric acid and aqueous acetic acid, and subsequently washing the materials with alkali to dissolve the lignin-oxidation products. The process features the use of 3-20% of nitric acid (based on the airdry weight of the materials) and a 50-90% aqueous acetic acid solution, and the passage of oxygen through the slurry of mixed acids and cellulosic material. E.G.S.

PAPER—COATED

GARDNER, HERBERT F. Paper coating. Canadian patent 466,222. Filed July 16, 1947. Issued June 27, 1950. 6 claims. Assigned to Stein, Hall & Co., Inc.

A coating composition comprises a white starch gum which has a solubility in water of 1-20% at 25° C.; the material gives a viscosity reading of 30 seconds on a Stormer viscometer, using a 500-gram weight and the high-viscosity cup, when dispersed in water in the ratio of one part of gum to 2-7.5 parts of water with heating at 190° F., followed by cooling and testing at 75° F. The gum is obtained by roasting a cornstarch under dry conditions at 350-450° F. in the presence of not more than 0.1% of a nondehydrating acid (based on the weight of starch), for a period of time less than that normally required to effect a color change from white to brown. E.G.S.

NELSON, HARLEY E. Method of coating. Canadian patent 466,223. Filed July 18, 1947. Issued June 27, 1950. 3 claims. Assigned to Stein, Hall & Co., Inc.

This is the same as U. S. patent 2,460,998; *cf.* B.I.P.C. 19: 520. E.G.S.

PUTNAM, CHARLES P., and BAKER, WEBSTER E. B. Web coating apparatus. U. S. patent 2,511,415. Filed May 16, 1945. Issued June 13, 1950. 8 claims. Assigned to New York and Pennsylvania Co., Inc. [Cl. 91-53; changed to 91-51]

This is covered in Canadian patent 451,236; *cf.* B.I.P.C. 19: 135. E.G.S.

TUTT, RICHARD, JR., and HUBBARD, JOHN R. Coating compositions and method of making the same. U. S. patent 2,513,121. Filed Sept. 25, 1946. Issued June 27, 1950. 6 claims. Assigned to Peter Cooper Corporations. [Cl. 106-137]

An alkaline-type, stable, aqueous, paper coating composition contains animal glue as the adhesive bonding agent; the glue is protected against alkaline hydrolysis and bacterial breakdown by the establishment of a buffered condition in the clay prior to the addition of the glue. The preparation of the

coating material comprises the steps of making a deflocculated clay slip with the aid of a deflocculating agent; adding 0.25-1.0% of caustic soda (based on the weight of clay) to adjust the pH of the final composition to 8.5-11.5; making an alkali-free animal glue solution which contains sufficient glue to bond together the pigment particles when the composition is applied to a surface; and adding the glue solution to the alkalized coating slip while thoroughly mixing the composition. E.G.S.

WILSON, JOSEPH D. Manifolding sheet material. U. S. patent 2,509,852. Filed July 13, 1945. Issued May 30, 1950. 3 claims. [Cl. 282-26; changed to 282-28]

This corresponds to Canadian patent 444,927; *cf.* B.I.P.C. 18: 277-8. E.G.S.

PAPER—COATED (HOT-MELT)

HORBACK, WILLIAM. Hot melting coating composition. U. S. patent 2,510,177. Filed Nov. 29, 1946. Issued June 6, 1950. 2 claims. Assigned to Celanese Corporation of America. [Cl. 106-181]

A heat-sealing, moistureproof, hot-melt coating composition for wood, paper, metal, or cloth comprises 100 parts by weight of cellulose propionate which has 0.3 free hydroxyl group per glucose unit and a viscosity of 50 centipoises, 90 parts of dibutyl sebacate, and 10 parts of butoxyethyl stearate. E.G.S.

PAPER—FILLERS

SAFFORD, MOYER M. Loading paper fibers with organopolysiloxane coated clay. U. S. patent 2,510,661. Filed May 6, 1944. Issued June 6, 1950. 3 claims. Assigned to General Electric Company. [Cl. 92-21]

A water-repellent paper is produced by the addition of a treated filler composition to the stock prior to beating; the pastelike material consists of a finely divided inorganic clay filler, the particles of which are coated with a thin water-repellent film of an organopolysiloxane, and ethyl alcohol. E.G.S.

PAPER SIZING

CASSADAY, JACK T. Non-crystallized rosin size and method of making the same. Canadian patent 465,960. Filed Oct. 13, 1942. Issued June 20, 1950. 9 claims. Assigned to American Cyanamid Company.

A liquid rosin size composition is resistant to crystallization upon storage; it contains a soap of a rosin which has been treated at elevated temperatures with 0.25-3% of its weight of sulfur, together with about 1-2% of a member of the group consisting of formaldehyde and water-soluble formaldehyde condensation products. E.G.S.

MASHBURN, ROBERT T. Dry size composition. Canadian patent 465,538. Filed Aug. 1, 1941. Issued May 30, 1950. 9 claims. Assigned to Hercules Powder Company.

A dry rosin size composition disperses readily in water to provide an aqueous sizing dispersion which has a high free-rosin content. The composition comprises the solidified product of a homogeneous mixture of molten rosin, 3-10% by weight of the rosin of sodium caseinate, and 0.5-5% by weight

of the rosin of sodium hydroxide. The product, which is a hard, brittle material with the general appearance and color of rosin, is stable to decomposition and degradation upon prolonged storage. E.G.S.

PAPER SPECIALTIES

AKE, JOHN E., and MILLER, KAY. Method of brittlizing pencil sheaths. U. S. patent 2,510,941. Filed April 22, 1949. Issued June 13, 1950. 6 claims. Assigned to Joseph Dixon Crucible Company. [Cl. 154-117]

A method is described for brittlizing the convolute paper sheath of a paper-wrapped pencil. The pencil is predried at a temperature of 250° F. or less and then subjected to a brittlizing temperature of 390-400° for 30-45 minutes. E.G.S.

BOOTH, RICHARD N. Method of making cigarette papers. U. S. patent 2,512,414. Filed Aug. 22, 1946. Issued June 20, 1950. 6 claims. [Cl. 164-17]

This corresponds to Canadian patent 453,361; *cf.* B.I.P.C. 19: 372. E.G.S.

EKSTEDT, JOHN W., PITYO, ALBERT F., and BUTTERFIELD, HARRY. Geographical globe. U. S. patent 2,510,213. Filed March 28, 1945. Issued June 6, 1950. 25 claims. [Cl. 35-46]

A geographical globe is formed from an absorbent fibrous material, such as paper, which has been coated or impregnated with a thermosetting resin. E.G.S.

FRANCK, ALBERT J. Envelope or jacket for the safe storage of phonograph records. U. S. patent 2,512,577. Filed Nov. 21, 1946. Issued June 20, 1950. 1 claim. Assigned one half to Richard W. Nagel. [Cl. 229-68]

A paper phonograph-record envelope has a uniform thickness over the entire surface of both faces of an enclosed record; this construction is designed to protect the record against uneven pressure distribution when placed in a horizontal or vertical stack. E.G.S.

FUCHS, WALTER M., and GAVATIN, ESKIL. Process of preparing flame-proofing glycol monosulfates. U. S. patent 2,511,911. Filed Jan. 5, 1949. Issued June 20, 1950. 7 claims. Gavatin's interest assigned to Fuchs. [Cl. 260-458]

A process is described for the preparation of glycol monosulfates which are suitable for use as paper-flameproofing agents. Equimolar quantities of a glycol (e.g., ethylene or propylene glycol) and sulfuric acid are combined below 40° C.; the initial reaction product is diluted and neutralized, while the temperature is still maintained below 40°. E.G.S.

HARVUOT, FRANK B. Filter cartridge. U. S. patent 2,512,797. Filed Sept. 28, 1945. Issued June 27, 1950. 2 claims. Assigned to Bowser, Inc. [Cl. 210-169]

A laminated filter cartridge is constructed of alternate, convolute layers

of phenol-formaldehyde resin-impregnated paper and crepe wadding. The structure does not become soggy when subjected to water, gasoline, oil, and other liquids. E.G.S.

HIGGINS, SIGFRIED. Matrix sheet and process of preparing same. U. S. patent 2,509,499. Filed June 26, 1947. Issued May 30, 1950. 10 claims. Assigned to Union Carbide and Carbon Corporation. [Cl. 18-47.5]

A thermosetting resin-fiber matrix sheet is brush coated on one side with a 10% aqueous solution of hydroxyethylcellulose (5% solution viscosity, 100 centipoises at 20° C.); the coating is air dried overnight. The original dull matte finish of the sheet composition is changed by the dried hydroxyethylcellulose to a glazed but still rough finish. A matrix is formed by compression molding the sheet against an electrotype; the resulting matrix surface is free of surface cracks and retains a matte surface on all relief areas. Various themoplastic materials can be molded against the matrix to produce printing plates, sound records, counters, and similar molded articles. E.G.S.

HOEHN, HARVEY H. Polymeric polyamines. U. S. patent 2,495,255. Filed Jan. 28, 1948. Issued Jan. 24, 1950. 8 claims. Assigned to E. I. du Pont de Nemours & Company. [Cl. 260-63]

A polymeric polyamine which is soluble in 5% aqueous acetic acid is suitable as a deflocculating agent for water-repellent waxes, as a water-repellent finish for paper and fabric, and as a wool-treating agent to reduce shrinkage; the material is also useful for fixing acid dyestuffs in fibers, fabric, and paper. E.G.S.

HOPKINS, RICHARD J., and SPROULL, REAVIS C. Capacitor paper. U. S. patent 2,505,545. Filed Oct. 16, 1944. Issued April 25, 1950. 2 claims. Assigned to General Electric Company. [Cl. 175-41]

A kraft paper which is suitable as a dielectric medium in electric capacitors has a density of 0.60-0.75 and contains 1-5% pentosans, 0.5-5.0% lignin, and 0.15-0.30% ash residue; the material has a power factor of 0.060-0.085% at 60° C. in a 60-cycle electric field. E.G.S.

LEANDER, RUSSELL J. Masking paper. U. S. patent 2,510,120. Filed May 31, 1946. Issued June 6, 1950. 2 claims. [Cl. 117-122; changed to 117-44]

A masking paper is impregnated with rubber or any similar material to render it stretchable (up to 15%) in two dimensions. A thermoplastic resin coating is applied to one face which is referred to as the "release" side; the opposite side is coated with parallel, spaced rows of a pressure-sensitive adhesive material. E.G.S.

LINDSAY, ALLEN R. Dielectric stencil. U. S. patent 2,512,347. Filed Sept. 23, 1948. Issued June 20, 1950. 4 claims. [Cl. 101-128.2]

A dielectric stencil comprises a sheet of uncoated, long-fiber, open-tissue paper which has been treated with chlorinated oil to seal the hygroscopic fibers and bond them together; a film containing animal wax bonded to the outer side of the sheet; and a second film containing synthetic rubber bonded to the wax film. An impression in the sheet defines a character which is to

be etched on a metallic surface; both films are perforated by the impression, and the synthetic rubber film is displaced to form a raised border around the impression. E.G.S.

LINDSAY, ALLEN R. Method of making dielectric stencils. U. S. patent 2,512,348. Filed Sept. 23, 1948. Issued June 20, 1950. 5 claims. [Cl. 101-128.2]

A method of making a dielectric stencil comprises coating one side of a sheet of uncoated, long-fiber, open-tissue paper with a film containing Buna rubber, molding a stencil from the coated sheet, impressing a character into the sheet in such a manner as to rupture and displace the film, filling the character with electrolyte, and then passing an electric current through the electrolyte to vulcanize the film surrounding the character. E.G.S.

MOORE, ROBERT C. Paper roll. U. S. patent 2,512,168. Filed March 8, 1949. Issued June 20, 1950. 3 claims. [Cl. 206-59; changed to 206-58]

A paper roll for a paper-dispensing pencil is provided with scored weakening lines which converge as they approach the center of the roll, so that a clean tear of paper from the roll is assured. E.G.S.

MOOSE, JOE E. Moistureproofing compositions. U. S. patent 2,500,426. Filed May 24, 1946. Issued March 14, 1950. 2 claims. Assigned to Monsanto Chemical Company. [Cl. 106-270]

Artificial paper flowers are coated with a translucent wax composition which consists of 40% by weight of paraffin, 35% of yellow ceresin, and 25% of *m*-terphenyl. The composition is also adapted for the moistureproofing of paper, fabrics, and other porous fibrous materials. E.G.S.

MOOSE, JOE E. Moistureproofing compositions. U. S. patent 2,500,427. Filed Aug. 22, 1949. Issued March 14, 1950. 2 claims. Assigned to Monsanto Chemical Company. [Cl. 106-230]

A hot-dip coating and impregnating composition for artificial paper flowers, artificial fruit, and the like consists of 37% by weight of *N*-*o*-xenylstearamide (softening point 59° C.), 60% of a microcrystalline petrolatum blend (softening point 69°), and 3% of hydrogenated rosin (softening point 98°). The composition is also suitable for moistureproofing paper, fabrics, and other porous fibrous materials. E.G.S.

MULENE, SYDNEY. Gramophone record envelope. Canadian patent 466,094. Filed Aug. 20, 1948. Issued June 27, 1950. 7 claims.

The binding flap of a phonograph record envelope is reinforced by a narrow strip of relatively thick cardboard. E.G.S.

NEWMAN, DOUGLAS A. Planographic printing sheet. U. S. patent 2,511,783. Filed Feb. 28, 1946. Issued June 13, 1950. 10 claims. Assigned to Columbia Ribbon and Carbon Manufacturing Company, Inc. [Cl. 101-149.2]

A laminated planographic printing sheet comprises two layers of paper which are parchmentized on only one side; the unparchmentized sides are

bonded together by means of a waterproof adhesive and are impregnated with the adhesive to a depth which is restricted by the inner limits of the hydrophilic amyloid layers which form the opposite sides of the sheets.
E.G.S.

REED, HAROLD B., SWANSON, FRED W., and PETERS, LEO. Bacon package. U. S. patent 2,509,450. Filed May 8, 1948. Issued May 30, 1950. 8 claims. Assigned to Fred W. Swanson. [Cl. 99-174]

A bacon package is formed of any suitable material such as parchment-type paper or cellophane, and consists of an elongated strip equipped with a tab at one end and a wrapper portion at the other end. The wrapper section incorporates laterally extending flaps for enclosing the ends of the finished package. E.G.S.

PHYSICAL TESTING—PAPER—GLOSS

BOOR, LADISLAV, and STOCK, CHARLES R. Glossmeter. Canadian patent 466,114. Filed May 11, 1945. Issued June 27, 1950. 7 claims. Assigned to American Cyanamid Company.

A glossmeter includes means for directing a concentrated beam of light onto a sample at a predetermined angle, as well as photoelectric means for receiving a narrow-angle beam from a small area of the sample. The photoelectric device is located in such a manner that narrow beams from the specularly reflected portion of the beam incident on the sample and from diffusely reflected light from the sample produce separate responses.
E.G.S.

PHYSICAL TESTING—PAPER—STIFFNESS

JOHNSON, CHARLES E. Machine for testing snap and recovery of sheet material. U. S. patent 2,510,401. Filed Dec. 22, 1947. Issued June 6, 1950. 6 claims. Assigned to Brown & Bigelow. [Cl. 73-100]

A paper-testing machine is designed to test the snap and recovery of paper stock on repeated bending of the same. A piece of paper or other material is supported and bent through a fixed but variable angle at constant speed; upon its release the paper exerts a force on a hammer, which force is transmitted to a steel ball mounted on an inclined plane between guide rails. The snap or recovery of the paper is measured in work units as the product of the weight of the steel ball and the height to which it rises on the inclined plane. E.G.S.

RAYON—VISCOSE PROCESS

KAYSER, GUILLAUME M. A. Treatment of alkali cellulose. U. S. patent 2,473,954. Filed Nov. 18, 1946. Issued June 21, 1949. 3 claims. Assigned to American Enka Corporation. [Cl. 260-233]

A process for delaying the aging of alkali cellulose comprises the addition of about 0.08% of sodium trithiocarbonate (based on the weight of alkali cellulose) to alkali cellulose during the shredding operation. E.G.S.

SHIPPING CONTAINERS

PRAWDZIK, CHARLES J. Carton and carton blank. U. S. patent 2,509,447. Filed July 17, 1947. Issued May 30, 1950. 3 claims.

Assigned to Union Bag and Paper Corporation. [Cl. 229-30; changed to 229-37]

A corrugated board shipping container is tapered in its vertical cross section and is specifically adapted for use in shipping and handling toilet bowls. E.G.S.

SCHOTT, LOUIS. Carton protector. U. S. patent 2,510,760. Filed Jan. 18, 1946. Issued June 6, 1950. 2 claims. [Cl. 229-23]

A metal (e.g., aluminum, sheet iron, or sheet steel) carton protector is designed for placement under stored, filled cartons; corner drains or drain openings in the protectors are included to prevent the accumulation of water beneath the cartons. E.G.S.

SIMMS, HAROLD A. Ventilated shipping container. U. S. patent 2,511,550. Filed June 7, 1946. Issued June 13, 1950. 1 claim. Assigned to The Patent and Licensing Corporation. [Cl. 229-6; changed to 229-15]

A corrugated chick box is designed to be set up from flat, foldable sheets without the use of staples, tape, glue, or other fastening means. E.G.S.

WILLIAMS, BENJAMIN M. Telescopic shipping carton. U. S. patent 2,510,004. Filed Nov. 1, 1947. Issued May 30, 1950. 1 claim. Assigned to Gaylord Container Corporation. [Cl. 229-14]

A relatively tall, heavy-duty, corrugated shipping container comprises upper and lower open-end tubular liner sections and slip-type upper and lower cover members. The carton may be packed by first filling the lower liner section and then filling the upper section after it has been placed on top of the lower section. E.G.S.

SHIPPING CONTAINERS—FIBER DRUMS

SCHNEIDER, EUGENE S. New-type drum package. U. S. patent 2,511,481. Filed May 11, 1949. Issued June 13, 1950. 5 claims. Assigned to Rohm & Haas Company. [Cl. 229-14]

A fiber-drum construction is adapted for the shipment of liquids in quantities of 50 gallons or more. The fiber drum is fitted with a flexible liner bag which can be formed of impregnated, laminated, or coated paper; for some applications it is preferable that the liner be made of a plastic material, such as polyethylene, polyfluorinated ethylene, polyvinylidene chloride, or similar inert, flexible, synthetic polymer. E.G.S.

SHIPPING CONTAINERS—MULTIWALL BAGS

YOUNT, STANLEY G. Method and apparatus for forming paper bags. U. S. patent 2,511,031. Filed Aug. 9, 1946. Issued June 13, 1950. 3 claims. [Cl. 93-35]

This corresponds to Canadian patent 455,282; *cf.* B.I.P.C. 19: 605. E.G.S.

STARCH

NEWTON, JOHN M., and OUGH, LEE D. Starch treatment. U. S. patent 2,497,838. Filed Nov. 16, 1948. Issued Feb. 14, 1950. 10 claims. Assigned to Clinton Industries, Inc. [Cl. 195-99]

A method of conditioning starch for enzymic conversion comprises the dissolution of calcium or magnesium phytate in hydrochloric acid, the addition of the solution to an aqueous starch slurry, the neutralization of the starch milk to a pH of 5-8 in order to precipitate the phytate on the starch, and the subsequent filtering, washing, and drying of the starch. The converted starch is suitable for use in paper coating compositions. E.G.S.

SULFITE WASTE LIQUOR

MACPHERSON, DONALD R. Hydraulic cement composition. Canadian patent 465,873. Filed July 13, 1946. Issued June 13, 1950. 8 claims. Assigned to The Master Builders Company.

This is the same as U. S. patent 2,435,594; *cf.* B.I.P.C. 18: 491. E.G.S.

TALL OIL

BOOTH, ROBERT B., and HERKENHOFF, EARL C. Beneficiation of iron ores. Canadian patent 466,111. Filed Dec. 8, 1943. Issued June 27, 1950. 19 claims. Assigned to American Cyanamid Company.

An iron ore is beneficiated by froth flotation in the presence of a collector which contains sulfonated tall oil as its essential collecting constituent. E.G.S.

GIESEKE, ELMER W. Tungsten ore flotation. Canadian patent 466,110. Filed Aug. 11, 1943. Issued June 27, 1950. 3 claims. Assigned to American Cyanamid Company.

The froth flotation of a tungsten ore which contains carbonate- and silica-bearing gangue is carried out in the presence of a reagent combination of an anionic promoter selected from the group consisting of the higher aliphatic acids, tall oil, and their sodium, potassium, and ammonium soaps; an alkali salt of a dioctyl sulfosuccinate; and quebracho. E.G.S.

HERKENHOFF, EARL C. Flotation of iron ores. Canadian patent 465,962. Filed Dec. 3, 1943. Issued June 20, 1950. 6 claims. Assigned to American Cyanamid Company.

A method of beneficiating low-grade iron ores containing siliceous gangue by froth flotation includes the use of an anionic promoter selected from the group consisting of the higher fatty acids, resin acids, tall oil, and their sodium, potassium, and ammonium soaps. E.G.S.

MCCOY, PAUL E. Slow-setting bituminous emulsions. U. S. patent 2,512,580. Filed June 14, 1948. Issued June 20, 1950. 9 claims. Assigned to Stancal Asphalt & Bitumuls Company. [Cl. 252-311.5]

The appearance and adhesive characteristics of a slow-setting bituminous emulsion is improved by the addition of 1-3% of sulfonated tall oil, based on the emulsion. E.G.S.

POLLAK, ARTHUR, and JOHNSTON, HENRY P. Purification of abietic acid. U. S. patent 2,510,755. Filed Dec. 19, 1946. Issued

June 6, 1950. 3 claims. Assigned to West Virginia Pulp and Paper Company. [Cl. 260-97.6]

One hundred pounds of crystalline abietic acid, as deposited in a centrifuge basket from crystallized tall oil, is sprayed in the spinning basket with a warm (120° F.) 0.5% sodium carbonate solution (about 50 gallons of solution in five minutes). The resulting crystals are then sprayed with live steam; the cake, containing about 4% moisture, is dried by spinning in a current of warm air. E.G.S.

VANILLIN

PEARL, IRWIN A. Production of vanillic acid. Canadian patent 465,894. Filed Jan. 2, 1945. Issued June 13, 1950. 8 claims. Assigned to Sulphite Products Corporation.

This is the same as U. S. patent 2,419,158; *cf.* B.I.P.C. 16: 372; 17: 541. E.G.S.

PEARL, IRWIN A. Production of vanillic acid. Canadian patent 465,895. Filed Feb. 28, 1945. Issued June 13, 1950. 2 claims. Assigned to Sulphite Products Corporation.

A method of preparing vanillic acid from vanillin begins with the addition of a silver nitrate solution containing one gram atom of silver to a solution containing one gram mole of vanillin and an excess of alkali at about 50° C. Silver oxide is generated in a nascent condition in the presence of the vanillin and alkali. The reaction mixture is acidified with sulfur dioxide to precipitate vanillic acid. This is the same as U. S. patent 2,458,295, which was issued Jan. 4, 1949. E.G.S.

WASTE HEAT

RICHTER, JOHAN C. F. C. Process of and apparatus for recovery of heat from fibrous pulp. Canadian patent 465,487. Filed Nov. 10, 1947. Issued May 30, 1950. 4 claims. Assigned to Aktiebolaget Kamyr.

A process is described for the recovery of heat from pulp as it is discharged continuously or intermittently from a digester. The pulp is transferred from the digester to a second closed vessel which is maintained at a pressure lower than that in the digester but higher than atmospheric pressure; low-pressure steam released by the pulp is removed from the second vessel; a liquid diluent is supplied to the pulp at the bottom of the second vessel; and pulp is discharged from the second vessel in such a manner that a continuous stock level is maintained with respect to the diluent inlet. E.G.S.

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